

[MUSIC]

[Pop captions up]

Steve Gibson: HI I'M STEVE GIBSON OF GRC.COM.

RAID DEMYSTIFIED, THE TECH OF
SOLID STATE DRIVES AND MR.
EXCEL IS IN THE HOUSE TODAY ON
"THE LAB WITH LEO LAPORTE".

[Pop captions down]

[MUSIC]

[Beeping]

[MUSIC]

Leo: HEY HOW ARE YOU?

[Pop captions up]

Leo: GOOD TO SEE YOU AND WELCOME.

IT'S TIME FOR "THE LAB".
I'M LEO LAPORTE AND THIS IS
THE SHOW WHERE WE EXPLAIN --

Kate: EVERYTHING.

Leo: EVERYTHING! REALLY?

Kate: MMM-HMM.

Leo: CAN WE JUST STICK TO
TECHNOLOGY FOR ME?

Kate: OKAY.

Leo: CAUSE I'M NOT TOO
SMART AT ANYTHING ELSE.
THAT'S KATE ABRHAM.
SHE'LL EXPLAIN EVERYTHING BUT
TECHNOLOGY AND I'LL TAKE CARE

OF THE TECHNOLOGY.

Kate: ABSOLUTELY.

[Pop captions down]

Leo: HOW ABOUT THAT?

Kate: MY BIG ENCYCLOPEDIA SHOW.

Leo: YOU COULD SAY HOW THE LIFE WORKS.

HOW, HOW THE UNIVERSE WORKS.

Kate: ABSOLUTELY.

Leo: ALL THAT STUFF AND

I'LL STICK WITH COMPUTERS,

CELL PHONES, CAMCORDERS, MP3

PLAYERS, HOME THEATER.

I CAN HANDLE THAT.

Kate: OKAY.

Leo: IT'S GOT A CHIP IN IT

I'LL TAKE CARE OF THAT.

Kate: IT'S A DEAL. IT'S A DEAL.

Leo: THIS IS EPISODE 155.

WE'RE SO GLAD YOU'RE HERE.

YOU KNOW WHO ELSE IS HERE?

YOU SAW HIM, STEVE GIBSON.

Kate: ABSOLUTELY.

Leo: YOU KNOW THEY, WE HAD

ONE OF THESE IS IT SAMSUNG?

THE SOLID STATE DRIVES.

THEY'RE FLASH DRIVES, 64

GIGABYTES FOR LIKE \$3,000.

Kate: OH AND THEY'RE VERY

CUTE AREN'T THEY?

Leo: THEY'RE CUTE BUT

THEY'RE PRICEY.

Kate: VERY TINY.

Leo: WE'RE GONNA TALK ABOUT

HOW THESE WORK.

HOW THEY'RE DIFFERENT FROM
REGULAR HARD DRIVES AND A FEW
THINGS YOU MIGHT WANT TO KNOW
BEFORE YOU BUY.

Kate: YEAH.

Leo: BESIDES THE PRICETAG.
BILL JELEN MR. EXCEL HE CAN'T
LEAVE IT ALONE.
HE'S GONNA TALK ABOUT PIVOT TABLES.
HE CAN'T LEAVE IT ALONE.

Kate: EVERYONE GOES OH MY GOSH?

Leo: ONE OF THESE DAYS I'M
GONNA PIVOT TABLES.

Kate: YEAH I KNOW I'M WITH
YOU, RIGHT.

Leo: AND THEN I SHALL I'M,
I'LL TELL YOU I'LL BE MR.
EXCEL JR.

THAT'S WHAT I'LL BE.

Kate: IN TRAINING.

[Laughs]

Leo: AND OUR HACKER IS
FRANK LINHARES.

Kate: YES.

Leo: AND HE'S GONNA TALK
ABOUT RAID, RAID!
THAT'S UM THE BIG HARD DRIVES
WHERE YOU --

Kate: MMM-HMM.

Leo: ANYWAY HE'LL DEMYSTIFY IT.

Kate: GREAT.

Leo: EXPLAIN IT ALL TO YOU.

BUT THE MOST IMPORTANT THING
IS OF COURSE OUR CALLERS.
WE'RE GONNA SPAN THE GLOBE
TODAY FOR CALLERS.

Kate: WE ARE.

Leo: LET'S START WITH OUR FIRST.

Kate: WE ARE HEADING TO
MONTREAL IN QUEBEC AND WE HAVE SCOTT.

Leo: THANK YOU KATE. HELLO SCOTT.

Scott: HI LEO.

[Pop captions up]

Leo: WELCOME TO "THE LAB".

Scott: THANK YOU.

UM IT'S, IT'S A PLEASURE.

Leo: YOU'RE BUNDLED UP TODAY.

Scott: YEAH IT'S A LITTLE
CHILLY IN MONTREAL.

Leo: I'M NOT SURPRISED.

[Laughs]

[Pop captions down]

Leo: WHAT CAN I DO FOR YOU?

Scott: WELL I'VE GOT, I'VE
GOT A WII AND I LOVE IT.

Leo: WII!

Scott: BUT I'M, I'M
WONDERING HOW I CAN TURN IT
INTO SOME KIND OF MEDIA CENTER
SO I CAN PLAY MY YOU KNOW MY
MP3S, MY MPEGS.

Leo: RIGHT. THERE ARE QUITE, THERE ARE
ACTUALLY A NUMBER OF DIFFERENT
WAYS TO DO THIS ODDLY ENOUGH.
I FOUND A, A WII HACKER SITE

THAT TALKS ABOUT A, A VARIETY
OF THESE DIFFERENT WAYS.

HIS, HIS NAME I'M NOT SURE HOW
YOU PRONOUNCE IT.

I THINK IT'S, IT'S LIQUORDICE

OR SOMETHING LIKE, IT'S

LICORICE WITH A D, ANYWAY IF

YOU GO TO

WIIHACKS.BLOGSPOT.COM HE HAS

PUT TOGETHER A LIST OF

DIFFERENT WAYS TO UM STREAM

MUSIC ON THE WII.

[Pop captions up]

Leo: AND SO THERE ARE YOU

CAN WINAMP FOR INSTANCE WILL

ACTUALLY STREAM OUT THE MUSIC.

YOU CAN CONTROL IT FROM THE

WII WEBPAGE, YOU KNOW THE WEB BROWSER.

Scott: WINAMP.

Leo: WINAMP.

UM THERE IS, THERE IS ITUNES

STREAMING, ITUNES STREAMING

YOU CAN ACTUALLY CONTROL

ITUNES FROM THE WII.

Scott: WOW.

Leo: WITH SOMETHING CALLED

DOCKS TUNES.

BUT THIS IS MY FAVOURITE, ITS

CALLED ORB.

Scott: ORB.

Leo: ORB, O-R-B.COM IT'S

ABSOLUTELY FREE.

WHAT YOU DO WITH ORB IS YOU'LL

SET UP YOUR ORB ACCOUNT OKAY
WITH VARIOUS THINGS.

[Pop captions down]

Leo: I HAVE MY FLICKR PHOTOS HERE.

YOU CAN HAVE VIDEOS.

YOU CAN HAVE MUSIC.

I ALSO HAVE NEWS.

YOU CAN HAVE ALL SORTS OF STUFF.

AND THEN YOU USE THIS TO, TO

THEY CALL IT MYCASTING.

AND YOU CAN ACTUALLY MYCAST

VIA THE WEB TO YOUR WII.

NOW THERE ARE DOWNLOADS SO YOU

CAN EVEN GET TELEVISION ON

THIS THING.

YOU'D INSTALL THIS DOWNLOAD

ONTO YOUR PC.

Scott: UH-HUH.

Leo: AND THEN YOU'D LOG ON

FROM YOUR WII.

THIS ALSO WORKS WITH PS3 AND

XBOX, EVEN MOBILE PHONES, PDAS

AND LAPTOPS.

YOU'D LOG ONTO MYCAST.ORB.COM

AND YOU'D BE SEEING THE VIDEO

THAT WAS COMING FROM YOUR TV

OR YOUR PC.

Scott: OH. SO, SO YOU'RE LIKING THE ORB,

THE ORB.

Leo: I THINK THAT'S THE WAY TO GO.

HAVE YOU PLAYED WITH IT?

Scott: NO.

Leo: I'M VERY IMPRESSED WITH THIS.

[Both talking at once]

Scott: -- I'M --

[Pop captions up]

Leo: ESPECIALLY SINCE ITS FREE.

UM THERE ARE OTHER WAYS.

AS YEAH IF YOU'RE ALREADY

USING WINAMP YOU KNOW YOU

MIGHT WANT TO STICK WITH IT IF

YOU'VE GOT WINAMP ALL SET UP

ON YOUR PC.

[Pop captions down]

Leo: BUT IF YOU DON'T HAVE

SOMETHING ALREADY SET UP I

THINK ORB IS A VERY

INTERESTING WAY TO DO THIS.

AND I HEAR MORE AND MORE

PEOPLE USING MYCAST THE ORBCAST.

IT ALLOWS YOU TO PUT ALL SORTS

OF CONTENT UP ON THE, ON THE,

ON THE CLOUD I GUESS AND TO,

TO STREAM IT.

THIS IS MY MYCAST PAGE.

SO I'M GONNA ADD MORE CHANNELS TO IT.

YOU KNOW THERE'S ALREADY STUFF IN HERE.

STOCK QUOTES, WEATHER, RSS

FEEDS AND YOU CAN PUT PHOTOS,

VIDEO AND MUSIC IN AS WELL.

Scott: WELL WHAT HAPPENS TO

MY MPEG, MY MPEGS THOUGH?

WILL THEY BE UP THERE?

Leo: YEAH.

Scott: OR EBEX, EBEXES?

Leo: YEAH.

YEAH ANYTHING THAT YOUR PC CAN PLAY --

Scott: OH OKAY.

Leo: WILL BE STREAMED

ACROSS THE NETWORK.

NOW I PRESUME YOU, YOU'VE GOT

YOUR WII ONLINE.

YOU OBVIOUSLY HAVE TO BE ABLE

TO HOOK YOUR WII UP TO YOUR

NETWORK RIGHT?

Scott: YEAH, YEAH.

IT, IT, IT'S WI-FIED IN.

Leo: RIGHT OKAY GOOD.

AS LONG AS YOU'VE GOT THAT

WORKING YOU KNOW A WI-FI

NETWORK --

[Both talking at once]

Scott: -- IT'LL STREAM IT OUT THE --

Leo: IT STREAMS IT OUT AND

THEN YOU USE THE WII BROWSER

TO ACCESS THE CONTENT.

Scott: THAT'S GREAT.

Leo: ISN'T THAT COOL?

Scott: YEAH THAT SOUNDS GREAT.

I --

Leo: CAUSE THE WII BECAUSE

THE WII DOESN'T HAVE A HARD

DRIVE YOU CAN'T THERE'S NOT

YOU KNOW MOST OF THIS STUFF

USES THE WII BROWSER BASICALLY

BECAUSE --

Scott: YEAH THEY'RE JUST

MISSING FLASH 8 IN THERE AND

THEN IT, THEN IT WOULD COOK.

Leo: FLASH WOULD MAKE A BIG DIFFERENCE WOULDN'T IT?
AND I DO THINK THAT THERE ARE SOME ATTEMPTS TO HACK THE WII TO PUT FLASH ON IT AS WELL YEP.

Scott: COOL.

Leo: BUT, BUT YOU DON'T NEED THAT FOR THE ORB STUFF.

Scott: GREAT.

Leo: ALL RIGHT?

HEY THANKS FOR THE CALL.

Scott: YOU GAVE ME A GREAT ANSWER.

Leo: GREAT TO TALK TO YOU SCOTT.

Scott: THANKS A LOT LEO.

Leo: WHAT GAMES DO YOU LIKE ON THE WII THESE DAYS?

Scott: PARDON ME?

Leo: WHAT ARE YOU PLAYING ON THE WII?

Scott: UM I'M PLAYING GHOSTSQUAD. I'M PLAYING OF COURSE THE SPORTS.

Leo: EVERYBODY LOVES WII SPORTS. YOU GOT ONE OF THOSE WII FITS YET? THAT'S WHAT I WANT.

I NEED THAT.

Scott: I AIN'T SEEN THAT YET.

Leo: NO?

[Laughs]

Leo: I THINK THEY'RE JUST COMING OUT NOW.

Scott: YEAH I, I, I COULD LIKE, I COULD SEE MY GIRLFRIEND USING THAT.

Leo: NOT YOU HUH?

[Laughs]

Leo: YOU'RE NOT GONNA DO
YOUR YOGA POSES ON YOUR WII?

[Laughs]

Scott: HMM IT COULD BE A TAD.

[Leo laughing]

Leo: THANKS TO TALK, THANKS
FOR CALLING US SCOTT.

IT'S GOOD TO TALK TO YOU.

Scott: THANK YOU LEO.

Leo: ALL RIGHT TAKE CARE.

Scott: TAKE CARE.

[Pop captions up]

Leo: COMING UP IN JUST A
BIT THESE ARE THE NEWEST
THINGS THESE SOLID STATE HARD DRIVES.

THEY'RE LOWER POWER.

THEY'RE MORE ROBUST CAUSE

THERE'S NO MOVING PARTS.

AH YOU'RE GONNA START SEEING

EM IN LAPTOPS BUT AT WHAT PRICE?

WE'LL FIND OUT WHEN STEVE

GIBSON OUR FRIENDLY SECURITY,

SECURITY AND HARD DRIVE GURU

WHEN "THE LAB" CONTINUES IN

JUST A BIT.

YOU STAY RIGHT HERE.

[MUSIC]

[Pop captions down]

[Commercial break]

[MUSIC]

Leo: WELCOME BACK TO "THE LAB".

LEO LAPORTE HERE.

STEVE GIBSON IS HERE ALSO FROM GRC.COM.

HE IS A HARD DRIVE GURU.

HE WRITES SPINRITE, WHICH IS
STILL TO THIS DAY AFTER TWO
DECADES THE SIMPLE, BEST, HARD
DRIVE MAINTENANCE UTILITY.

BUT YOU MIGHT BE OUT OF
BUSINESS PRETTY SOON BECAUSE
FLASH DRIVES ARE HERE, SOLID
STATE MASS STORAGE.

Steve Gibson: AND YOU DO
NOT WANT TO RUN SPINRITE ON THEM.

[Pop captions up]

Leo: YOU DON'T NEED TO.

Steve Gibson: YOU DON'T NEED TO.
BUT YOU DON'T WANT TO.

Leo: RIGHT.

Steve Gibson: IT TURNS OUT
THAT, THAT THE FUNDAMENTAL
TECHNOLOGY IN THESE FLASH
DRIVES GIVES THEM A LIMITED
NUMBER OF WRITES.

ONE OF THE ADVANTAGES OF A
SPINNING MAGNETIC DISK BECAUSE
YOU CAN, YOU CAN WRITE IT AND
REWRITE IT --

[Pop captions down]

Leo: ALMOST INFINITELY.

Steve Gibson: YEAH
INFINITELY UNTIL ITS BERRIES
DRY UP OR SOMETHING.

Leo: UNTIL IT DIES, RIGHT.

[Laughs]

Steve Gibson: I MEAN THE,
THE PROBLEM IS THEY ARE
MECHANICAL AND WHAT WE'RE
SEEING OF COURSE IS A, A
DRAMATIC REDUCTION IN THE
PRICE OF NON-VOLATILE MEMORY
DRIVEN LARGELY BY THE CRAZE IN
MEDIA PLAYERS AND CAMERAS.

Leo: NOW LOOK --

Steve Gibson: YOU KNOW EVERYONE WANTS SD CARDS.

Leo: LET'S STEP BACK A LITTLE BIT.
YEAH I WANT PEOPLE TO
UNDERSTAND WHAT WE'RE TALKING ABOUT.
SO THIS IS THE SAME KIND OF
MEMORY THAT YOU PUT IN YOUR,
YOUR CAMERA?

Steve Gibson: YES.

Leo: THIS IS JUST THE SAME STUFF?

Steve Gibson: IT'S JUST MORE OF IT.

Leo: IT'S FLASH.

Steve Gibson: IT'S MORE OF IT.

Leo: AND YOU HAVE ENOUGH OF
IT IN A DRIVE TO DO WHAT WE
SAW ONE FROM SAMSUNG IT WAS 64 GIGS.

Steve Gibson: RIGHT.

Leo: AND HOW MUCH WAS THAT SEAN?
IT WAS --

Sean Carruthers: \$2,000.

Leo: 2,000 BUCKS.

Steve Gibson: YES.

Leo: THEY'RE PRICEY.
BUT 64 GIGS IN A DRIVE IS NOW

WHY WOULD YOU WANT TO DO THAT?

CAUSE I CAN GET MUCH MORE ON A DISK.

Steve Gibson: WELL IT IS

GONNA BE MUCH MORE ROBUST IN

ANY KIND OF A MECHANICAL --

Leo: THERE'S NO WEAR AND TEAR.

Steve Gibson: NOTHING TO MOVE.

Leo: YEAH.

Steve Gibson: YOU, YOU

COULD DROP IT FROM A FEW

INCHES AND NOT BOUNCE THE

HEADS ON THE SURFACE.

Leo: OKAY.

[Pop captions up]

Steve Gibson: SO IT'S JUST

A MORE IT'S, IT'S LIKE IT'S

WHY THE IPODS ARE TRYING TO

GET AWAY YOU KNOW THE APPLE

IPOD WAS, WAS ORIGINALLY A

LITTLE HARD DISK DRIVE.

Leo: RIGHT.

[Pop captions down]

Steve Gibson: AND THEY WERE

DYING ON PEOPLE ALL THE TIME.

Leo: RIGHT.

Steve Gibson: THE NEWER

ONES HAVE GONE TO 8 AND 16

GIGS WHICH ARE BIG ENOUGH --

Leo: A SOLID STATE STORAGE.

Steve Gibson: THAT YOU KNOW

A SOLID STORAGE.

Leo: SO THE, THE BESIDES

THE EXPENSE THE OTHER PROBLEM

IS THAT YOU WEAR THEM OUT FASTER.

Steve Gibson: YES.

Leo: NOW HOW, HOW FAST?

Steve Gibson: WELL THEY SAY
THAT A, A GIVEN LOCATION CAN
HANDLE ABOUT 100,000 WRITE CELLS.

Leo: WELL THAT'S A LOT.
HOW MANY TIMES ARE YOU GONNA WRITE?

Steve Gibson: IT IS A LOT.
BUT THERE ARE SOME AND, AND
THEY'VE, THEY'VE ADVANCED THE
TECHNOLOGY.
THE WAY THESE THINGS WORK YOU
KNOW THEY, THEY DON'T HAVE A BATTERY.
YOU REMEMBER LIKE THE, THE
BIOS MEMORY ON OUR MOTHERBOARDS?
YOU GOT A LITTLE, A LITTLE
COIN BATTERY TO KEEP THE CMOS ALIVE.
WELL THIS IS NOT CMOS.

THIS, THIS USES METAL OXIDE --
Leo: IT'S JUST LIKE YOUR MEMORY CARD.
YOU DON'T HAVE TO CHARGE IT.
IT JUST HOLDS THE BATTERIES FOREVER.

Steve Gibson: EXACTLY.

Leo: YEAH.

Steve Gibson: AND IT DOES
IT, IT DOES IT BY, BY HAVING A
UM A LITTLE CHUNK OF METAL
CLOSE TO TWO CONNECTORS.
BUT SEPARATED BY AN INSULATOR
AND PUSHING ELECTRONS ONTO
THIS LITTLE ISLAND OF METAL
WHERE THEY'RE STRANDED.

AND THEN A FIELD EFFECT
TRANSISTOR IS, IS, IS
ESSENTIALLY WHAT THAT IS.
IT CAN SENSE THAT THE CHARGE
IS UP THERE AND BECAUSE IT'S,
IT'S, IT'S FLOATING ABOVE AN
INSULATOR ITS STUCK.
SO THAT'S HOW WRITE A 1.

Leo: HMM.

Steve Gibson: THEN YOU, YOU
DRAIN THEM OFF YOU PULL THE
ELECTRONS OFF IN ORDER TO PUT
IT BACK TO A ZERO.
THE PROBLEM IS FORCING THE
ELECTRONS THROUGH THIS
INSULATOR DEGRADES IT A LITTLE BIT.
SO THAT'S CHEMICALLY THAT'S
HOW OVER TIME --

Leo: I SEE.

Steve Gibson: THEY END UP
SORT OF FADING.

Leo: YEAH IT WEARS OUT.

Steve Gibson: YOU HAVE, YOU'VE GOT BIT FADE.

Leo: OKAY.

UM HOW LONG DO WE EXPECT THESE
DRIVES TO LAST?

Steve Gibson: THEY PROBABLY WILL LAST --

Leo: IN TIME.

Steve Gibson: SUBSTANTIALLY
LONGER THEN, THEN A MECHANICAL
HARD DRIVE.
RIGHT NOW THEY'RE MUCH MORE EXPENSIVE.
BUT FOR EXAMPLE --

Leo: WELL WAIT A MINUTE
THAT'S INTERESTING.
SO EVEN THOUGH YOU HAVE THIS
DAMAGE THEY SHOULD LAST LONGER
THAN A ROTATING DRIVE?

Steve Gibson: YES.
WHAT'S HAPPENED IS BECAUSE OF
THIS, THIS 100,000 WRITE LIMITATION.

[Pop captions up]

Steve Gibson: FOR EXAMPLE
IF YOU HAD A SWAP FILE ON ONE
OF THESE YOU, YOU YOU'RE
BASICALLY WINDOWS IS WRITING
TO THE SWAP FILE ALL THE TIME.
MOVING MAIN MEMORY ONTO THE
DRIVE AND BACK.
SO THAT WOULD JUST BE WRITING
REDUNDANTLY, LIKE FOR NO
PURPOSE AT ALL.
SO THE MANUFACTURERS HAVE,
HAVE ADDED TECHNOLOGY THAT
SPREADS THE WRITING ACROSS THE
WHOLE PHYSICAL SURFACE.

Leo: MMM-HMM, MMM-HMM.

[Pop captions down]

Steve Gibson: SO THAT EVEN
IF YOU APPEAR TO BE WRITING TO
THE SAME LOGICAL LOCATION
YOU'RE ACTUALLY DOING THE
WRITES SCATTERED ACROSS THE SURFACE.

Leo: SO IT WEARS OUT, IT
WEARS OUT MORE EVENLY.

Steve Gibson: YEAH SO YOU,

YOU DON'T BURN OUT ONE SPECIFIC --

Leo: YEAH YOU HAVE THESE HOLES.

Steve Gibson: AREA OF THE DRIVE.

Leo: SO IS IT FASTER THAN A
REGULAR SPINNING HARD DRIVE?

Steve Gibson: OH IT'S WELL YES.

NOW ONE OF THE REASONS WE ALL
KNOW THAT THE, THE SD CARDS
TEND NOT TO WRITE VERY FAST.

Leo: RIGHT.

Steve Gibson: THE REASON IS
THEY HAVE TO BUILD UP A
VOLTAGE IN ORDER TO POKE
THROUGH THAT INSULATOR.

Leo: OKAY.

Steve Gibson: BUT THEY READ
AT REGULAR RAM SPEED.

Leo: UH-HUH.

Steve Gibson: SO IN, IN ANY
SITUATION WHERE YOU'RE READING
MOSTLY LIKE AN IPOD WHERE
YOU'RE LISTENING TO YOUR MUSIC.
YOU'RE READING FROM IT.

Leo: RIGHT.

Steve Gibson: AND YOU'RE
ONLY OCCASIONALLY WRITING TO
IT, IT MAKES SENSE TO --

Leo: THAT'S A REALLY GOOD
CHOICE CAUSE YOU'RE NOT GONNA
WEAR IT OUT AND IT'S GONNA
READ FAST.

Steve Gibson: RIGHT, EXACTLY SO --

Leo: WHAT ABOUT PUTTING

THEM ON YOUR COMPUTERS?
CAUSE THAT'S WHERE WE'RE
STARTING TO SEE THESE APPLICATIONS.

Steve Gibson: WELL I MEAN
AND IT MAKES ABSOLUTE SENSE IN
A COMPUTER.

THERE IS A SETTING THAT NOT,
NOT MANY PEOPLE ARE AWARE OF.
FOR EXAMPLE IN XP YOU'RE ABLE
TO CHANGE THE, THE WRITING
STRATEGY TO ANY SD CARD OR
EVEN USB DRIVE.

NORMALLY XP --

Leo: CAUSE IT'S THE READY
DRIVE SYSTEM, SYSTEM.

Steve Gibson: ACTUALLY NOT EVEN THAT.
THAT'S IN VISTA.

IN EVEN IN, IN XP YOU CAN SAY
I WANT TO, I WANT TO SET IT
FOR SAFETY, WHICH MEANS IT
FLUSHES THE, IT FLUSHES
IMMEDIATELY TO THE DRIVE.

Leo: RIGHT.

[Pop captions up]

Steve Gibson: OR PERFORMANCE.

Leo: RIGHT.

Steve Gibson: AND IF YOU
SET IT FOR PERFORMANCE IT
CACHES IT AND THEN ONLY
PERIODICALLY WRITES IT OUT.

Leo: RIGHT.

Steve Gibson: BUT YOU HAVE
TO BE CAREFUL NOT TO LIKE

UNMOUNT THE DRIVE OR EJECT IT --

[Pop captions down]

Leo: RIGHT.

Steve Gibson: BEFORE YOU PULL IT OUT.

Leo: SO IF YOU HAVE A BUILT
IN HARD DRIVE YOU PROBABLY
WOULD WANT TO RUN IN THAT
JOURNALED MODE THAT, THAT,
THAT PERFORMANCE MODE RIGHT?

Steve Gibson: RIGHT.

Leo: YEAH.

Steve Gibson: RIGHT BECAUSE
YOU, YOU WANT TO BUFFER IN RAM
AND ONLY WRITE OUT TO THE, THE
NON-VOLATILE MEMORY WHEN
THINGS HAVE SORT OF SETTLED DOWN.

Leo: SO UM DO YOU NEED TO
DEFRAGMENT THESE DRIVES?

Steve Gibson: NO.

Leo: THEY DON'T GET FRAGMENTED?

Steve Gibson: THEY DON'T
AND YOU DON'T WANT TO CAUSE DEFRAG --

Leo: IT'LL WEAR IT OUT.

Steve Gibson: IT'S JUST MOVING STUFF AROUND.

Leo: RIGHT.

[Pop captions up]

Steve Gibson: AND SINCE
THERE'S NO HEAD TO MOVE BACK
AND FORTH BEING, BEING
FRAGMENTED DOESN'T IT DOESN'T
HURT YOU AT ALL.

Leo: RIGHT.

IS DATA RECOVERY DONE THE SAME WAY?

Steve Gibson: NO.

FOR EXAMPLE SPINRITE WOULD NOT
BE USEFUL ON A SOILD STATE
DRIVE WHERE IT ABSOLUTELY IS
ON A MAGNETIC DRIVE.

Leo: MMM-HMM.

Steve Gibson: SO THAT CHANGES.

[Pop captions down]

Steve Gibson: BUT FILE
SYSTEM RECOVERY WOULD BE DONE
THE SAME WAY.

Leo: CAUSE THAT'S
INDEPENDENT OF HOW IT'S WRITTEN.

Steve Gibson: IT DOESN'T MATTER, EXACTLY.

Leo: RIGHT.

Steve Gibson: HOW THE
ACTUAL DATA IS STORED.

Leo: UNERASING A FILE
THINGS LIKE THAT.

Steve Gibson: EXACTLY.

Leo: FIXING A PARTITION.
UM AND HOW ABOUT SECURITY?
ARE THESE AS, IS THERE ANY
DIFFERENCE OR IS IT PRETTY
MUCH THE SAME?

Steve Gibson: YEAH NO
DIFFERENCE IN SECURITY.

Leo: YEAH IT'S FROM THAT'S
ALL AT THE HIGHER LEVEL
ANYWAY.

Steve Gibson: RIGHT.

Leo: SO IT SOUNDS LIKE

THESE ARE A GOOD CHOICE WHEN
THE PRICES COME DOWN.
HOW SOON BEFORE PRICES START
TO FALL?

Steve Gibson: WELL I WOULD
SAY THEY'RE, THEY'RE I MEAN
THEY'RE PRACTICAL NOW AT THE
HIGH-END.

Leo: IF YOU CAN AFFORD IT.
I MEAN \$2,000 IS AS MUCH AS
THE WHOLE COMPUTER COST.

Steve Gibson: YES.
ALTHOUGH LOOK AT IPODS THAT
HAVE 16 GIGS --

Leo: TRUE, TRUE.

Steve Gibson: BUILT INTO THEM --

Leo: RIGHT.

Steve Gibson: SO CLEARLY
AS, AS VOLUME INCREASES PRICES
ARE GONNA COME DOWN.
EVERYONE BELIEVES THAT THE,
THAT THE GOOD OLD-FASHIONED
SPINNING MAGNETIC HARD DRIVE
IS SO MATURE THE TECHNOLOGY IS
SO MATURE AND LOOK HOW
INEXPENSIVE THEY ARE TODAY.

Leo: YEAH.

Steve Gibson: THEY'RE INSANELY BIG.

Leo: YEAH.

Steve Gibson: IT'S GONNA BE
A LONG TIME BEFORE THEY GO AWAY.
BUT IN AN INCREASING NUMBER OF
MORE DEMANDING PHYSICAL

APPLICATIONS YOU JUST WON'T
WANT TO HAVE SOMETHING
SPINNING AND THE POWER CONSUMPTION.

Leo: OH THEY USE THAT IT'S LOWER POWER.

Steve Gibson: THEY USE
MUCH, MUCH LESS POWER.

Leo: PERFECT FOR A LAPTOP.

Steve Gibson: YEAH YOU KNOW DRIVES GET HOT.

Leo: RIGHT.

Steve Gibson: AND THE
REASON THEY'RE GETTING HOT IS
ALL IS, IS, IS --

Leo: WASTED ENERGY YEAH.

Steve Gibson: IS ALL THE ENERGY COMING OUT IN HEAT.

Leo: RIGHT, RIGHT.

Steve Gibson: YOU DON'T
HAVE THAT WITH A SOLID STATE DRIVE.

Leo: VERY INTERESTING.

Steve Gibson: SO IN A
BATTERY APPLICATION, A BATTERY
APPLICATION IT MAKES A LOT OF SENSE.

Leo: YEAH.

[Pop captions up]

[Blank for boards]

Leo: IS THE PLACE TO GO AND
STEVE EVEN THOUGH HE'S GONNA
BE OUT OF BUSINESS AS SOON AS
THESE THINGS FORTUNATELY
SPINNING DRIVES WILL BE AROUND
FOR A WHILE.

AND YOU KNOW OF COURSE HE DOES
A LOT OF OTHER THINGS INCLUDING --

Steve Gibson: INCLUDING

DOING OUR PODCAST.

Leo: INCLUDING THE SECURITY
NOW PODCAST WHICH WE TALK
ABOUT THINGS LIKE THIS EVERY THURSDAY.
THAT'S AT TWIT.TV OR GRC.COM
HIS WEBSITE.

YOU'LL ALSO FIND GREAT
SECURITY SOFTWARE FOR FREE
LIKE SHIELDS UP, SHOOT THE
MESSENGER, DECOMBOBULATOR AND
LET'S NOT FORGET WIZMO.

Steve Gibson: OH WIZMO.

Leo: EVERYBODY LOVES WIZMO.

Steve Gibson: GOT TO HAVE WIZMO.

Leo: GRC.COM THANK YOU STEVE.
ALL RIGHT WE'RE GONNA TAKE A BREAK.
BUT RIGHT NOW I WANT YOU TO
TAKE A LOOK AT SOMETHING YOU'D
FIND AROUND "THE LAB".

IT'S OUR RUDE SOLO LIGHT AND
OH BOY WE'VE REALLY GOT TO USE
THAT MORE OFTEN BECAUSE KATE
KEEPS TAKING THESE RUDE SOLOS.
I DON'T KNOW WHAT THAT IS.

GO TO THE, DO YOU?

I'LL TELL YOU WHAT.

WE'LL ZOOM OUT AND WE'LL FIND
OUT WHEN "THE LAB" CONTINUES.
YOU STAY RIGHT HERE.

[MUSIC]

[Pop captions down]

[Commercial break]

[MUSIC]

[Pop captions up]

Leo: WHAT THE TECH IS THAT?

IT'S A MIXER.

THE RUDE SOLO LIGHT ON A MIXER.

I KNOW THAT!

I KNEW THAT ONE!

[Pop captions down]

Leo: THAT'S THE MIXER THAT

OUR GOOD CHUCK D USES TO TURN

UP MY VOLUME.

AND THE RUDE SOLO YOU PRESS

THAT BUTTON IT, IT TURNS

EVERYBODY ELSE OFF.

THAT'S WHY IT'S RUDE.

SO HE PRESSES THAT BUTTON AND

YOU ONLY HEAR ME.

YOU DON'T HEAR ALL OF THEM AND

THAT WOULD BE A RUDE SOLO.

LET'S GET ANOTHER CALL FROM

KATE ABRAHAM.

Kate: OKAY WE ARE GOING TO

A PLACE CALLED I AM GOING TO

TRY AND PRONOUNCE THIS.

I THINK IT'S LONGUEUIL IN

QUEBEC AND WE HAVE HUGO.

Leo: HUGO.

Hugo: YES.

[Pop captions up]

Leo: LONGUEUIL, LONGUEUIL?

Hugo: AH YOU SAY IT LONGUEUIL.

Leo: LONGUEUIL.

Hugo: LONGUEUIL.

Leo: LONGUEUIL.

WHAT CAN I DO FOR YOU?

SORRY ABOUT THE --

Hugo: YEAH.

Leo: BUT WE WEREN'T SURE OF
THE NAME OF YOUR TOWN.

I APOLOGIZE.

Hugo: NO PROBLEM.

Leo: LONGUEUIL.

Hugo: NO PROBLEM LEO.

Leo: WHAT CAN I DO FOR YOU HUGO?

Hugo: I'M, I'M THINKING OF
CHANGING MY 22-INCH CRT MONITOR
FOR A 24-INCH LCD.

Leo: I SEE IT RIGHT BEHIND YOU.
THE PICTURE THAT YOU SENT IS
US THAT --

[Pop captions down]

Leo: THERE'S THE VIEWSONIC 22.

Hugo: YEAH, YEAH.

IT DOESN'T LOOK THAT BIG ON
THE PICTURE.

BUT THING IS HUGE.

IT DRAWS A LOT OF POWER AND IT
GENERATES SO MUCH HEAT.

Leo: YEAH NOT SO MUCH HUGE
ACROSS BUT HUGE BEHIND, ITS, ITS DEEP.

Hugo: YEAH AND IT'S SO HEAVY.

Leo: CAUSE YOU HAVE TO HAVE
A BIG GLASS TUBE IN THERE YEAH.

Hugo: I CAN'T, I CAN'T
TELL, I CAN'T SEE A BURGLAR
GETTING IT ANYWHERE.

[Leo laughing]

Leo: THAT'S THE ADVANTAGE.

THEY'RE HARD TO STEAL.

[Laughs]

Hugo: YEAH EXACTLY.

YEAH MY, MY PROBLEM IS THAT IF
I LOOK AT THE LCD MONITOR THE
NATIVE RESOLUTION.

Leo: YEAH.

Hugo: I, I DON'T SEE IT
LISTED IN THE SUPPORTED
RESOLUTIONS OF MY VIDEO CARD.

Leo: YOU, YOU WILL ONCE YOU
GET THE MONITOR.

WELL ACTUALLY THAT'S NOT
NECESSARILY TRUE.

UM PART OF THE REASON THAT YOU
DON'T SEE IT IS BECAUSE YOUR
VIDEO CARD IS USING THIS 22-
INCH MONITOR AS ITS MONITOR DEFINITION.

[Pop captions up]

Leo: SO IT WILL ONLY SHOW
WHAT THE 22 CAN DO.

Hugo: YEAH.

BUT I, I WAS THINKING OF
LOOKING IN THE ACTUAL SPECS BUT --

Leo: YEAH YOU MAY YOU KNOW
YOU HAVE TO HAVE ENOUGH VIDEO
MEMORY TO SUPPORT 1900 BY 1200.

Hugo: YEAH.

Leo: WHICH IS THE, THE
DEFAULT USUALLY ON THESE 24S
THE DEFAULT RESOLUTION.

Hugo: YES THAT'S WHAT I THOUGHT.

[Pop captions down]

Leo: YEAH.

SO WELL ONE WAY YOU CAN DO IT
IS A LITTLE CALCULATION,
MULTIPLY 1900, 20 BY 1200.

Hugo: OKAY.

Leo: I THINK IF YOU HAVE 64
MEGS OF VIDEO RAM THAT'S ENOUGH.

Hugo: YEAH.

I HAVE, I HAVE 128 IN THAT.

Leo: OH THAT'S PLENTY.

WELL --

Hugo: ITS ONE YEARS OLD BUT
THAT'S WHY I'M, I'M ASKING.
MAYBE I'M --

[Both talking at once]

Leo: DON'T WORRY.

WHAT, WHAT KIND OF CARD IS IT?

Hugo: IT'S AN ATI RADION 9700 PRO.

Leo: OH YEAH YOU CAN
ABSOLUTELY SUPPORT A 24P MONITOR.

Hugo: YEAH? OKAY.

Leo: WHERE YOU'D, WHERE
YOU'D HAVE TROUBLE YOU
COULDN'T DO 30 INCHES.

Hugo: OKAY.

WELL THAT'S, THAT'S A LITTLE
OVER BUDGET FOR ME.

Leo: HEY THEY'RE GETTING
CHEAPER AND CHEAPER.
I WAS JUST LOOKING AT EM.
HERE'S THE DELL 24 WHICH I
LIKE A LOT 469, 469 BUCKS.

YOU PAYED --

Hugo: YEAH IT'S AMAZING.

Leo: YOU PROBABLY PAYED TWO
OR THREE TIMES THAT FOR YOUR 22.

Hugo: I, I PAYED 700 BUCKS
FOUR YEARS AGO FOR THAT ONE.

Leo: YEAH, YEAH THERE YOU GO.

[Pop captions up]

Leo: AND LET ME JUST
ACTUALLY THEY SELL A 30 NOW
THE DELL.
LET ME JUST SEE WHAT THE DELL
CAUSE I DON'T EVEN WANT TO, I
SHOULDN'T EVEN CHECK BECAUSE
I, I BOUGHT A, A 30 APPLE DISPLAY.
I THINK IT WAS 2,000 WHEN I BOUGHT IT.
LET'S JUST SEE WHAT DELL'S 30-
INCH DISPLAYS ARE.
I'M GONNA BE DEPRESSED.
I KNOW I AM.

Hugo: YEAH SO.

Leo: 1189, YEAH IT'S STILL PRETTY PRICEY.
BUT THOSE WILL DROP TOO.

Hugo: YEAH.

Leo: A 30 IS AWFULLY BIG
AND YOU KNOW I'M LOOKING AT
YOUR SETUP HERE.
YOU REALLY DON'T WANT A 30-
INCH MONITOR THERE.
BUT A 24 WOULD BE PERFECT AND
THEY'RE GREAT FOR WATCHING
HDTV TOO VIDEO.

Hugo: YEAH.

Leo: NO YOUR 9700 WILL BE JUST FINE.

Hugo: OKAY.

Leo: YEP NO PROBLEM AT ALL.

Hugo: OKAY.

Leo: IT'S, IT'S, IT'S HOW
MUCH VIDEO RAM YOU HAVE AND
YOU CAN FIGURE THAT OUT BY
JUST MULTIPLYING THE TWO TOGETHER.

Hugo: YES OKAY.

Leo: AND, AND IF IT'S, IF
IT'S GOT MORE PIXELS THEN YOU
HAVE MEMORY OBVIOUSLY YOU
CAN'T DISPLAY THE AH GET THAT RESOLUTION.

Hugo: YEAH.

Leo: OKAY?
ENJOY YOU'RE GONNA LOVE THESE.

Hugo: YEAH OKAY.

Leo: THEY REALLY LOOK GOOD.

Hugo: THANK YOU.

Leo: HEY THANKS SO MUCH HUGO.

Hugo: OKAY.

Leo: TAKE CARE.

Hugo: YEAH.

Leo: BYE-BYE, LONGUEIUL, LONGOY.

Kate: LONGOY.

Leo: LONG-OY.
SEAN CARRUTHERS IS HERE.
HE'S GOT A SHINY, HE'S GOT A SHINY.
I SEE NO SHINY.

[Beep]

Leo: WHERE'S YOUR, I HEARD A BEEP.
IS IT IN THERE?

Sean Carruthers: YES.

Leo: ARE YOU HIDING YOUR
SHINY FROM ME?

[Beep]

Sean Carruthers: YES.

Leo: LET YOUR SHINY FLY.
WHAT IS IT?

STOP BEEPING AT ME.

Sean Carruthers: IT'S AN ANNOY-O-TRON.

Leo: IT'S THE ANNOY-O-TRON 2000.

Sean Carruthers: THIS IS
THE THINK GEEK ANNOY-O-TRON.

[Leo laughing]

Sean Carruthers: WHICH IS DESIGNED TO --

Leo: WHAT DOES IT DO?

Sean Carruthers: IT'S DESIGNED TO ANNOY YOUR
COWORKERS.

Leo: BY BEEPING?

Sean Carruthers: BY BEEPING.
SO THE CONCEPT IS THIS.
YOU FLIP IT ON.

Leo: YEAH.

Sean Carruthers: AND IT
WILL EMIT AN ANNOYING SOUND.

Leo: OH THAT'S A REALLY
HIGH-PITCHED BEEP RIGHT THERE.

[Pop captions up]

Sean Carruthers: YEAH.

[Beep]

Sean Carruthers: AND YOU
HAVE SEVERAL DIFFERENT PITCHES.
YOU HAVE THIS ONE.
YOU'VE GOT --

Leo: SO IT COULD SOUND LIKE

A AH, OH THAT'S REALLY, THAT'S
LIKE RIGHT AT THE EDGE OF YOUR HEARING.

[Pop captions down]

Sean Carruthers: YEAH DEFINITELY.

[Beep]

Leo: AND IF YOU'RE A YOUNG
PERSON THAT'S GONNA DRIVE YOU CRAZY.

Sean Carruthers: RIGHT.

Leo: YOU KNOW WHAT'S GOOD ABOUT THAT?
IF YOU'RE MY AGE YOU CAN'T HEAR IT.
YOU JUST WALK ALONG BLITHELY
AND EVERYBODY ALL THE PEOPLE
UNDER 25 ARE GOING AHFFF!

Sean Carruthers: SO HERE'S THE THING.

Leo: WHAT?

Sean Carruthers: IT EMITS THAT BEEP --

Leo: YEAH.

[Pop captions up]

Sean Carruthers: AT IRREGULAR INTERVALS.

Leo: AH AND YOU CAN'T
FIGURE OUT WHERE IT IS.

Sean Carruthers: SO YOU CAN'T LOCATE IT.
SO BECAUSE OF THIS, THE KIND
OF NOISE IT IS.

Leo: THAT'S LIKE WHEN A
SMOKE ALARM BATTERY STARTS
GOING DEAD.

[Pop captions down]

Sean Carruthers: RIGHT.

Leo: OH IT'S SO ANNOYING.

Sean Carruthers: SO HIDE IN THE, IN A,
YOU KNOW IN AN INACCESSIBLE PLACE.

Leo: RIGHT.

Sean Carruthers: THERE'S A
MAGNET HERE SO YOU CAN STICK
IT UNDERNEATH A DESK.

Leo: OH THAT'S SO MEAN.

Sean Carruthers: AND YOU KNOW --

Leo: ONE OF THE GREAT
PRANKS IT WOULD BE.

Sean Carruthers: BECAUSE
IT'S SO IRREGULARLY SPACED IN
TERMS OF THE BEEPING IT'LL BE
VERY HARD TO LOCATE AND YOU'LL
DRIVE PEOPLE CRAZY.

Leo: I LOVE THINK GEEK THEY'RE SO --

Sean Carruthers: YEAH.

Leo: THIS IS JUST HYSTERICAL.

Sean Carruthers: SO ITS, ITS \$10 FOR THAT.

Leo: WELL WORTH IT.

Sean Carruthers: WELL WORTH IT.

Leo: THINK OF ALL THE JOY.

[Beep]

Leo: AND FUN YOU'LL HAVE.

Sean Carruthers: YEAH.

THE PROBLEM IS, IS THAT YOU
KNOW IT'S GONNA IRRITATE YOU
TOO POTENTIALLY.

Leo: WELL DUH.

[Laughs]

[Pop captions up]

Sean Carruthers: IF YOU
FORGET WHERE YOU PUT IT, SO
IT'S, IT'S --

[Leo laughing]

Leo: POSITIVE, ON THE

POSITIVE ON THE PLUS SIDE YOU
CAN DRIVE COWORKERS CRAZY.

Sean Carruthers: OH YOU CAN
DRIVE THEM ABSOLUTELY INSANE
WITH THIS.

AND IT IS FAIRLY EASY TO HIDE.

Leo: YEAH.

Sean Carruthers: YOU CAN
TUCK IT AWAY FAIRLY EASILY.
AND THE IRREGULAR BEEPS MAKE
IT REALLY HARD TO LOCATE.
YOU CAN'T EVEN WAIT FOR THE
NEXT BEEP.

SO AND IF THEY DO FIND IT
THEY'LL BREAK IT.

[Beep]

Sean Carruthers: AND YOU'LL BE OUT THE \$10.

Leo: YOU MIGHT AS WELL GET USED TO THAT.

[Laughs]

Sean Carruthers: YEAH IT'S,
IT'S GONNA ANNOY YOU TOO
ESPECIALLY IF THEY FIND IT AND
REHIDE IT ON YOU.

Leo: ALL RIGHT.

WELL WE'LL MAKE SURE THAT WE
DON'T HIDE THIS ANYWHERE THAT
ANYBODY WOULD BE BOTHERED BY IT.
THAT WOULD BE WRONG SO WE
WON'T PUT IT ANYWHERE.
WE'LL JUST TAKE IT AND YOU CAN
GET RID OF THIS OKAY?

HEY DON'T!

WE DON'T KNOW WHERE IT IS DO WE?

[Pop captions up]

Leo: THAT'S A GOOD SHINY.
I LIKE THAT THINKGEEK.COM, FOR
MORE SHINIES LABWITHLEO.COM.
COMING UP MR. EXCEL IN JUST A MOMENT.
HE'S GONNA SHOW US SOME GREAT
STUFF IN EXCEL 2007.
PIVOT TABLES THEY'RE EVEN
EASIER THEN BEFORE.
WE'LL FIND OUT.
HE LOVES THESE PIVOT TABLES.
RIGHT NOW THOUGH IT'S QUIZ TIME.

[Blank for boards]

[Beep]

Leo: AHEE, AHEE I'D LIKE TO
CANCEL THAT NOISE.

IS IT --

[Blank for boards]

Leo: OR OW!
BLOCK IT WITH A REALLY LOUD SILENCE.

[Beep]

Leo: HOW A REALLY LOUD
SILENCE IS VERY EFFECTIVE.
HOW DO IT WORK?
WE'LL FIND OUT WHEN "THE LAB"
CONTINUES.
STAY HERE.

OW!

THAT REALLY HURTS AND I'M --

[MUSIC]

[Pop captions down]

[Commercial break]

[MUSIC]

Leo: LOOK AT THAT MR.
EXCEL, GOLD, GOLD COINS.
THEY'RE REAL GOLD TOO, SOLID GOLD.
AND YOU SEE LIKE THAT?
1,000% GOLD!

Bill Jelen: SWEET.

Leo: YEAH.
THEY ACTUALLY HAVE CHOCOLATE
INSIDE TOO.
HEY THANK YOU MR. EXCEL THOSE
ARE, HE ALWAYS BRINGS THESE
AND I LOVE THAT.
SO MR. EXCEL IS BACK.
HE IS THE, THE KING OF EXCEL.
HE KNOWS MORE ABOUT EXCEL THEN
ANY HUMAN ALIVE.
AND HE ALSO I KNOW HE WOULDN'T
SAY THAT CAUSE HE'S HUMBLE.
BUT I SAY IT.
HE ALSO WROTE THE BOOK "PIVOT
TABLE DATA CRUNCHING".
NOW I'VE BEEN READING YOUR
LAST EDITION.
THIS IS THE NEW ONE FOR EXCEL 2007.

Bill Jelen: YEAH AND THE
TABLES ARE EASIER IN EXCEL 2007.

Leo: WELL THAT'S I'M WONDERING.
DO I NEED TO RELEARN
EVERYTHING I'VE LEARNED IN 2003?

Bill Jelen: NO.

Leo: NO?

Bill Jelen: BECAUSE YOU'RE
NEVER GONNA USE THEM ANYWAY.

Leo: I'M NOT.

[Laughs]

Leo: AND HE LOOKS AT ME LIKE THAT.
YOU KNOW IT'S THE REPROACHING LOOK.
YOU'LL NEVER USE PIVOT TABLES.

Bill Jelen: AND IF YOU
WOULD EVER NEED A PIVOT TABLE
YOU WOULD JUST WRITE TO ME.

Leo: I LOVE PIVOT, THAT'S WHAT I DO.
I CALL MR. EXCEL.
I SEND HIM A QUESTION.
SO UM FIRST OF ALL WHAT ARE
PIVOT TABLES?

[Pop captions up]

Bill Jelen: PIVOT TABLES
ALLOW YOU TO TAKE 550,000 EVEN
500,000 RECORDS OF DATA IN
EXCEL AND SUMMARIZE IT
BASICALLY IN SIX CLICKS.

[Pop captions down]

Leo: THAT'S GREAT.

Bill Jelen: NO FORMULAS.

Leo: YEAH.

Bill Jelen: UM YOU CAN JUST
DRAG FIELDS AROUND THE REPORT
AND SUMMARIZE THE DATA VERY, VERY --

Leo: THAT'S REALLY GREAT.

[Pop captions up]

Leo: AND THAT'S WHERE I GET
LOST IS DRAGGING THEM TO
DIFFERENT AXIES AND HOW IT --

Bill Jelen: WELL SEE NOW
THAT'S THE THING THAT THEY

CHANGED IN EXCEL 2007.

Leo: OH GOOD.

Bill Jelen: YOU DON'T DRAG
IT TO THE REPORT ANYMORE.
YOU DRAG IT TO NEW DROP ZONES.

[Pop captions down]

Leo: AHH.

Bill Jelen: WHICH ACTUALLY
MAKES IT EASIER FOR FOLKS LIKE YOU.

Leo: WELL LET'S TAKE A LOOK.
FOLKS LIKE ME, OH NITWITS.

Bill Jelen: ALTHOUGH WE, WE
NEVER YOU CAN'T PASS AN
OPPORTUNITY TO MOCK THE RIBBON.

Leo: THE RIBBON.

Bill Jelen: THE RIBBON, THE
RIBBON'S IN THE NEW INTERFACE
IN EXCEL 2007.

Leo: YES.

Bill Jelen: AND IN EXCEL
2003 WE HAD A DATA MENU AND ON
THE DATA MENU WERE THINGS LIKE
SORT AND FILTER AND AUTO FILTER --

Leo: PERFECTLY LOGICAL.

Bill Jelen: PIVOT TABLES.

Leo: LOGICAL, YEAH.

Bill Jelen: WELL NOW WE
HAVE NEW TABS.
WE HAVE HOME, INSERT PAGE
LAYOUT, FORMULAS, DATA.

Leo: OKAY.

Bill Jelen: REVIEW AND VIEW
AND SO WHEN WE GO TO LOOK FOR

PIVOT TABLES YOU WOULD EXPECT
THAT THEY WOULD BE ON THE DATA
MENU.

Leo: OF, OF COURSE THEY WOULDN'T.

Bill Jelen: THEY'RE NOT.

Leo: AH VIEW?

Bill Jelen: NO.

Leo: NO?

Bill Jelen: NOW LET ME GIVE YOU A CLUE.

Leo: REVIEW?

Bill Jelen: ALL THE
IMPORTANT STUFF, ALL THE
POWERFUL THINGS --

Leo: YEAH.

Bill Jelen: ARE ON THE HOME TAB.

Leo: OHH BECAUSE THEY PUT
STUFF ON THE HOME TAB THEY
FIGURE YOU'RE GONNA USE A LOT.

Bill Jelen: RIGHT BUT PIVOT
TABLES AREN'T HERE.

Leo: NO.

OH YOU TRICKED ME!

WHERE ARE THEY?

Bill Jelen: I HAVE, HERE'S MY THEORY.
HERE'S MY PERSONAL THEORY.

Leo: YEAH.

Bill Jelen: I THINK THEY
WANTED TO ADD IT TO THE RIGHT
SIDE.

Leo: THEY RAN OUT OF ROOM.

Bill Jelen: THEY RAN OUT OF ROOM.
SO THEY WENT TO THE NEXT TAB
WHICH IS CALLED INSERT.

Leo: AH.

Bill Jelen: IT'S LIKE THE
FIRST THING ON THE INSERT.
IT'S ALMOST LIKE IT'S AN, IT'S
AN ADDENDUM.

Leo: YEAH.

Bill Jelen: AN ADDENDUM TO
THE WHOLE THING.

Leo: BUT YOU ARE IN A WAY
LIKE INSERTING A CHART YOU ARE
INSERTING SOMETHING INTO YOUR
SPREADSHEET AND THAT'S THE
PIVOT TABLE RIGHT?
SO IT MAKES SENSE.

Bill Jelen: WE SHOULD WRITE
THIS THING DOWN.

Leo: YEAH.

Bill Jelen: YOU'RE DEFENDING MICROSOFT.

Leo: I AM.

Bill Jelen: YEAH.

Leo: IN THIS CASE IT KIND
OF MAKES SENSE TO ME CAUSE YOU
INSERT A CHART INTO A SPREADSHEET.
YOU'RE INSERTING --

Both: A PIVOT TABLE.

Leo: YEAH, RIGHT?

Bill Jelen: YOU'RE RIGHT.

Leo: OKAY.

Bill Jelen: YOU'RE ABSOLUTELY RIGHT.

Leo: OKAY.

Bill Jelen: I WILL TAKE
BACK ALL OF MY MOCKING.

[Leo laughing]

Bill Jelen: ALL RIGHT SO WE
HAVE OUR DATA SET HERE.
THIS ONLY HAS 500 ROWS.
BUT LET'S SAY THAT OUR MANAGER
COMES TO US AND SAYS HEY WE
NEED TOTAL SALES BY REGION AND
PRODUCT.

Leo: SURE THAT'S A WELL
I'LL BE BACK TO YOU TOMORROW.

Bill Jelen: RIGHT.

Leo: IS WHAT IS KEY BY THE WAY.
HE'S TAUGHT ME THIS.
OH YES WE CAN DO THAT.
IT'S GONNA TAKE US EIGHT HOURS.

Bill Jelen: BUT WE, WE
CLICK THE PIVOT TABLE BUTTON.
THAT'S CLICK NUMBER 1.

Leo: OKAY.

Bill Jelen: CLICK NUMBER 2
IT IDENTIFIES WHERE THE DATA
IS SO I CLICK OKAY.

Leo: YEAH.

Bill Jelen: AND HERE WE ARE
WITH OUR NEW INTERFACE.

Leo: OOH THIS IS DIFFERENT.

Bill Jelen: YEAH.

Leo: OKAY.

Bill Jelen: SO OVER HERE WE
HAVE THE FIELDS.

Leo: THOSE ARE ALL THE DIFFERENT FIELDS.

Bill Jelen: LIKE WE USED TO HAVE.
BUT AT THE BOTTOM OF THE LIST --

Leo: WAIT A MINUTE.

YOUR EXCEL, YOUR EXCEL YOUR
AH, YOUR OUTLOOK KEEPS POPPING UP.
THERE IT IS.
THERE WE GO.
OKAY.

Bill Jelen: THAT'S WILD OKAY.

SO WE HAVE THE FIELD LIST AT
THE BOTTOM.

Leo: YEAH.

Bill Jelen: HERE ARE THE FOUR DROP ZONES.

OKAY SO WHAT DID THE MANAGER
WHEN HE WANTED TO SEE TOTAL BY
REGION AND PRODUCT.

UM REGION IS EASY.

I'M JUST GONNA CLICK IT AND IT
AUTOMATICALLY GOES TO THE --

Leo: IT ADDS ITS LITTLE LABEL OKAY.

Bill Jelen: BUT PRODUCT IF

I WOULD JUST CLICK PRODUCT IT
WOULD GO TO THE WRONG SPOT.

SO I'M GONNA TAKE THE PRODUCT
FIELD AND DRAG IT HERE TO
WHERE IT SAYS --

Both: COLUMN --

Bill Jelen: LABELS AND THAT
PUTS IT ACROSS THE TOP.

[Both talking at once]

Leo: SO OKAY AND THAT'S THE TOP.

SO THE LEFT WOULD BE THE
REGION RIGHT.

SO IT'S, IT'S PRODUCT BY REGION.

Bill Jelen: YES. AND NOW WE HAVE TO ADD
SOMETHING NUMERIC.

Leo: OKAY.

Bill Jelen: AND THAT'S
GONNA BE OUR REVENUE FIELD THING.

Leo: AND THAT'S GONNA GO IN THE VALUE.

Bill Jelen: RING, THEY RING
IN TO BE THE, THE SUM VALUES
OR THE SIGMA VALUES.

Leo: I GET IT, I GET IT, I GET IT.

Bill Jelen: OKAY.

Leo: I'M STARTING TO I
THINK THIS MADE, MADE AN
IMPROVEMENT FOR ME.

Bill Jelen: SO I CLICK REVENUE.

Leo: REVENUE AND IT KNOWS
ENOUGH TO PUT IT THERE BY IT,
BY IT --

[Both talking at once]

Bill Jelen: BECAUSE THAT
FIELD IS ALL NUMERIC.

Leo: OKAY.

Bill Jelen: ALL RIGHT?

Leo: THAT DID IT.

Bill Jelen: SO THAT'S THE FIRST THING.
SO THAT BASICALLY 1, 2, 6
CLICKS.

Leo: NOW YOU GO HAVE PLAY A
ROUND OF GOLF, HAVE A NICE LUNCH.

Bill Jelen: RIGHT.

Leo: AND TOMORROW MORNING
YOU BRING YOUR BOSS THE REPORT.

Bill Jelen: EXACTLY.

Leo: I SLAVED OVER THIS BOSS.

Bill Jelen: EXACTLY.

AND THEN INVARIABLY THE
MANAGER SAYS WELL THAT'S GREAT
BUT I WANT PRODUCTS DOWN THE SIDE.

Leo: YEAH, YEAH.

Bill Jelen: OR I WANT REGIONS ACROSS THE TOP.

Leo: YEAH.

Bill Jelen: WELL IT'S VERY EASY NOW.
WE JUST DRAG THE FIELDS AROUND
THE DROP ZONES UM AND IT'S
GOOD TO GO.

Leo: OH THAT WAS EASY.

Bill Jelen: NOW WATCH THIS.
NOW THE MANAGER SAYS WELL I'D
LIKE TO SEE CUSTOMER.

Leo: YES.

Bill Jelen: OKAY SO WE
CLICK THE CUSTOMER FIELD.

Leo: OKAY.

Bill Jelen: ALL RIGHT AND
IT'S ADDED IT IN HERE TO COLUMN A.

Leo: YEAH.

Bill Jelen: SO WE HAVE THE
FIRST PRODUCT IN CUSTOMER.

Leo: SO IT'S SORTED BY
CUSTOMER, OKAY YEAH.

Bill Jelen: BUT THEY, THEY
HAD THIS FUNCTIONALITY BEFORE
BUT IT WAS NEVER OBVIOUS.
THERE'S THESE NEW COLLAPSE BUTTONS.

Leo: OH I LOVE THAT.

Bill Jelen: SO I CAN GO
INTO THE STAFF MEETING SHOWING
THE PRODUCTS AND WHEN THE DEF

MANAGER YOU KNOW GETS TO HIS
PIECE I CAN SAY OH WELL HERE'S
YOUR CUSTOMERS.

Leo: HERE'S YOUR CLIENTS OH.

Bill Jelen: SO WE HAVE
EXPAND AND COLLAPSE BUTTONS.

Leo: AND THAT'S ALL AUTOMATIC.

Bill Jelen: THAT'S ALL
AUTOMATIC AND IT'S UP HERE UM
RIGHT HERE IN THE RIBBON WE
HAVE EXPAND ALL OR COLLAPSE ALL.

Leo: OH I SEE.

Bill Jelen: SO I CAN EXPAND
ALL OR COLLAPSE ALL.
AND THE AMAZING THING IS I TRY
AND EXPAND SOMETHING ELSE
LET'S SAY I TRY AND EXPAND THE
CUSTOMER FIELD.

Leo: YEAH.

BUT THERE SHOULDN'T, IT
SHOULDN'T BE ABLE TO EXPAND THAT.

Bill Jelen: IT, IT SAYS OH
WELL OKAY GREAT I'LL EXPAND.
I'LL EXPAND.

TELL ME WHAT YOU WANT TO
EXPAND IT BY.

Leo: OH.

Bill Jelen: AT REGION AND, AND --

Leo: I THINK EVEN I COULD
DO PIVOT TABLES NOW.

Bill Jelen: THERE YOU GO.
THERE YOU GO.

Leo: I THINK I UNDERSTAND THAT.

Bill Jelen: ALL RIGHT.

SO LET ME SHOW OFF A FEW MORE
COOL FEATURES THAT WE HAVE.

Leo: OKAY.

Bill Jelen: WE'LL PUT
REGION ACROSS THE TOP MAYBE.

Leo: THEY NEED TO CHANGE
THE NAME FROM PIVOT TABLES TO
LIKE ACTIVE REPORTS OR
SOMETHING LIKE THAT.

[Pop captions up]

Bill Jelen: OR AUTO SUMMARY.

Leo: AUTO SUMMARY.

[Both laugh]

Leo: THEY, THEY NEED SOMETHING.
OKAY.

Bill Jelen: OKAY.

[Pop captions down]

Bill Jelen: IN THE OLD
PIVOT TABLE FUNCTIONALITY THEY
HAD 15 DIFFERENT FORMATS.

Leo: RIGHT.

Bill Jelen: AND EVERY
FORMAT WAS COMPLETELY EVIL.
FOR INSTANCE NO ONE, NO ONE
ALIVE WOULD EVER USE ANY OF THEM.

Leo: THEY HAD TERRIBLE FORMATS.

Bill Jelen: WE, WE NOW HAVE 24,000 FORMATS.

Leo: OH, OH WELL THAT'S AH --

Bill Jelen: AND, AND
THEY'RE ALL PRETTY COOL TO BE
HONEST UM --

Leo: THESE ARE, THESE ARE

DIFFERENT WAYS YOU CAN MAKE --

Bill Jelen: RIGHT.

Leo: TO STYLE THEM TO LOOK

Bill Jelen: JUST TO, TO

PRETTY UP THE REPORT VERY QUICKLY.

Leo: YEAH LOOK AT THAT.

Bill Jelen: AND I CAN TURN

ON BANDED ROWS OR BANDED

COLUMNS SO WE GET THE LITTLE --

Leo: UH-HUH.

Bill Jelen: IN THIS CASE

IT'S JUST ADDING LINES IN.

BUT IN SOME OF THE LIGHTER

FORMATS IT WOULD ACTUALLY GIVE ME --

Leo: YOU'LL GET COLOURS.

Bill Jelen: LIKE THE

ALTERNATING ROW, HERE LIKE THIS.

Leo: RIGHT.

LIKE THE OLD, THE OLD --

[Both talking at once]

Leo: YEAH LOOK AT THE SIZE

OF THAT SCREENBAR, LOOK AT

THAT, THAT'S GREAT.

Bill Jelen: AND IF YOU

DON'T LIKE THESE COLOURS OF

COURSE ON THE PAGE LAYOUT WE

CAN SWITCH TO ANY ONE OF 20

OTHER THEMES.

SO I CAN VERY QUICKLY AND YOU

CAN SEE HOW WE HAVE LIVE PREVIEW.

Leo: THAT'S ONE THING THEY

DID WELL IN OFFICE 2007.

Bill Jelen: OH I AGREE.

Leo: WAS THE SEAMING AND
THE LIVE PREVIEWS JUST REALLY
MAKE IT EASY TO MAKE A GOOD
LOOKING YOU KNOW REPORT
WHETHER IT'S WORD OR EXCEL.

Bill Jelen: RIGHT.

ONE LAST COOL FEATURE THEY
HAVE IS SOME NEW FILTER TECHNOLOGY.

NORMALLY WHEN WE GO WITH DATES
OF COURSE WE HAVE THIS WEIRD
THING WHERE IT HAS EVERY
INDIVIDUAL DATE.

BUT WE CAN YEAH I WANT TO SEE
60 DAYS AND I'M GONNA, AND I'M
GONNA CHECK 60 OF EM.

Leo: JUST SHEESH OH BOY.

Bill Jelen: BUT THEY HAVE
SOME VIRTUAL FILTERS WHERE WE
CAN SAY HERE --

Leo: OH NEXT WEEK, NEXT MONTH?

Bill Jelen: YEAH.

Leo: OH THAT'S GOOD.

Bill Jelen: NEXT QUARTER, NEXT YEAR.

Leo: OKAY GOOD, PHEW.

Bill Jelen: YEAR TO DATE.

THAT'S A GOOD ONE.

Leo: YEAH.

Bill Jelen: IT'S ALMOST LIKE QUICKBOOKS.
QUICKBOOKS HAS A BETTER LIST WHERE --

Leo: RIGHT, RIGHT, RIGHT.

Bill Jelen: ALL DATES IN
JANUARY OR SOMETHING.

SO YOU CAN ACTUALLY YOU CAN

FILTER MUCH EASIER AND ALSO
SOME VIRTUAL FILTERS.

WE USED TO BE ABLE SOMETHING
CALLED THE TOP 10 REPORT.

Leo: OH I REMEMBER THAT.

THAT WAS THE GOOD OLD DAYS
WASN'T IT?

[Both laugh]

Leo: OH I REMEMBER THE TOP 10 REPORT.

Bill Jelen: AND THAT, THAT
KIND OF THING.

Leo: IT'S GONE.

Bill Jelen: NO IT'S THERE.
THEY HAVE THAT BUT OTHERS LIKE
EVERYTHING ABOVE AVERAGE.

Leo: SEE NOW ABOVE AVERAGE
WE LOVE THAT ONE.

Bill Jelen: OKAY.

Leo: NOW THAT, THAT THEY'VE
MADE IT SO EASY IN 2007 I
THINK I'M GONNA USE PIVOT TABLES MORE.

[MUSIC]

Leo: BUT OF COURSE MR.
EXCEL MAKES IT LOOK SO EASY
WHEN HE SHOWS YOU.
WHAT YOU REALLY NEED TO DO
YOU'RE GONNA SIT DOWN YOU'RE
GONNA WONDER WHAT DID HE DO?
YOU GET THIS BOOK.

IT'S ALL IN HERE.

STEP BY STEP "PIVOT TABLE DATA
CRUNCHING FOR MICROSOFT EXCEL 2007".

THERE'S ONE FOR 2003 TOO IF

YOU WANT TO GO BACK IN TIME.

Bill Jelen: AND DEFINITELY
MAKE SURE YOU GET THE RIGHT VERSION.

Leo: YEAH.

Bill Jelen: DEPENDING ON WHAT YOU'RE USING --

Leo: CAUSE IT'S DIFFERENT.

Bill Jelen: BECAUSE THE
INTERFACE IS COMPLETELY DIFFERENT.

Leo: COMPLETELY DIFFERENT.
THIS ISN'T ONE WHERE YOU SAY
IT COVERS ALL VERSIONS OF
EXCEL CAUSE IT CAN'T.

Bill Jelen: NO IT CAN'T, IT CAN'T.

Leo: YEAH.

THIS IS, THIS IS THE POWER
USER BOOK AND BOY I'LL TELL
YOU ONCE YOU GO TO PIVOT
TABLES YOU CAN CRANK OUT THOSE
REPORTS LIKE --

Bill Jelen: IT'S AMAZING
WHAT YOU CAN DO, RIGHT.

Leo: IT'S REALLY VERY REALLY NEAT.

[Pop captions up]

Leo: MR. EXCEL DOES ANSWERS
TENS OF THOUSANDS OF QUESTIONS
FREE EVERY YEAR AT HIS WEBSITE --

[Blank for boards]

Leo: AND HE'S EVEN GIVING
AWAY HIS BIG NEW BOOK "LEARN
EXCEL FROM MR. EXCEL"
ABSOLUTELY FREE ONLINE AT
MREXCEL.COM.

YOU COULDN'T BE NICER ABOUT

THAT AND ALL HE ASKS IS IF YOU
LOVE THE BOOK THAT YOU BUY A
COPY FOR YOUR FRIEND OR EVEN
FOR YOURSELF OR MAYBE TWO OR THREE.
THANK YOU MR. EXCEL YOU'RE THE BEST.

Bill Jelen: THANKS LEO.

Leo: YEAH.

[Pop captions up]

Leo: TIME TO HAVE SOME CHOCOLATE.
MORE OF YOUR CALLS COMING UP
WHEN "THE LAB WITH LEO" CONTINUES.
OH IT REALLY IS GOLD.

[MUSIC]

5, 4, 3, 2, 1.

[MUSIC]

[Pop captions down]

[Commercial break]

[MUSIC]

[Pop captions up]

Kate: HEY WELCOME BACK TO
"THE LAB WITH LEO".
I'M KATE ABRAHAM AND NOW ITS
TIME FOR MY TIP OF THE DAY AND
THESE ARE FOR GAMERS OUT THERE.

[Pop captions down]

Kate: IT'S A WEBSITE CALLED
KONGREGATE.COM AND BASICALLY
IT'S AN ONLINE HUB FOR ANYBODY
WHO DEVELOPS GAMES, ANYBODY
WHO PLAYS THEM WHERE THEY CAN
MEET, CHAT AND EXCHANGE COOL
IDEAS SO KONGREGATE.COM.

[Pop captions up]

Kate: IT'S A REALLY COOL
SITE AND THE GREAT THING IS
THAT IT'S COMPLETELY FREE TO
USE AND IF YOU DESIGN GAMES
YOU CAN UPLOAD THEM WITHOUT A PROBLEM.
AND YOU CAN ALSO PLAY THEM AND
THEN RATE THEM.
AND AS YOU CAN SEE THERE'S A
TON OF GAMES ON HERE.

[Pop captions down]

Kate: AND OBVIOUSLY THE,
THE BETTER THE RATING
OBVIOUSLY THE MORE PLAYS
THEY'VE HAD.
SO I WANT TO HAVE A LITTLE GO
AT 3D LOGIC II WHICH IS AS YOU
CAN SEE THEY REALLY ARE WELL-
MADE GAMES.
AND I JUST WANT TO SIT HERE
AND JUST PLAY THIS COOL LITTLE
FLASH GAME.

Leo: WOW LOOK AT THAT.

Kate: WHILE YOU TAKE
ANOTHER CALL.

Leo: AND THESE ARE FREE?

Kate: ABSOLUTELY FREE AND
THE COOL THING IS THAT THE
DEVELOPERS ACTUALLY UPLOAD THEM.

Leo: YEAH WOW KONGREGATE WITH A K.

Kate: SO YOU CAN GIVE FEEDBACK AS WELL.

Leo: I LIKE THAT.

I'M GONNA GO CHECK THAT OUT.

Kate: YEAH KONGREGATE.COM.

Leo: OH GOOD, GOOD.

Kate: OKAY?

Leo: AND NOW --

Kate: AND NOW --

Leo: ANOTHER CALL!

Kate: ANOTHER CALLER.

WE HAVE MICHAEL FROM OTTAWAR
IN ONTARIO.

Leo: THANK YOU KATE.

[Both talking at once]

Michael: HEY HOW YOU DOING?

Leo: HELLO MICHAEL.

[Pop captions up]

Michael: HI LEO.

Leo: OTTAWAR.

[Laughs]

Kate: EVERYTHING I SAY --

[Talking background]

Leo: LONGOY, OTTAWAR.

HEY MICHAEL WHAT CAN WE DO FOR YOU?

Michael: WELL I HAD AN
ISSUE WITH MY MAC.

I UPGRADED FROM, FROM TIGER TO LEOPARD.

Leo: YEAH.

Michael: AND I'VE BEEN
MOSTLY HAPPY WITH IT.

LIKE THE UPGRADE SYSTEM IS GREAT.

WHEN I FIRST MADE THIS

TRANSITION THOUGH UM WHEN YOU

GOT TO THE LOG IN SCREEN IT

WOULD ACTUALLY HANG.

Leo: YES.

Michael: YOU GET THAT YOU

KNOW NICE LITTLE SPINNING
BEACHBALL THING THAT
EVERYONE'S SO FAMILIAR WITH.
AND OF COURSE AT THAT POINT I
COULD NOT LOG IN OR GET ANY
ACCESS TO THE COMPUTER.
AND AN HOUR LATER ON TECH
SUPPORT WITH THE APPLE END
THEY BASICALLY SAID YOUR ONLY
OPTION IS TO FORMAT.

Leo: THAT'S NOT TRUE.

[Pop captions down]

Michael: YEAH AND I FIGURED
THERE WAS OTHER OPTIONS.

Leo: THAT'S NOT TRUE.

I DID YOU, DID YOU FORMAT IT?

Michael: I DID ACTUALLY
EVENTUALLY DECIDE TO FORMAT IT.
I YOU KNOW WAS SMART AND
BACKED EVERYTHING UP.
I WAS JUST TRYING TO AVOID THE
HASSLE OF A FORMAT.

I --

[Both talking at once]

Leo: LET ME, LET ME ASK YOU SOMETHING.
HAVE YOU EVER HEARD OF HAXIES?

Michael: NO.

Leo: OKAY.
UNSANITY MAKES A PROGRAM
CALLED THEY, THEY CALL EM
HAXIES AND THERE WAS ONE IN
PARTICULAR CALLED MENU MASTER
THAT CAUSED A LOT OF PROBLEMS

FOR PEOPLE UPGRADING TO LEOPARD.

YOU DID AN UPGRADE FROM TIGER I PRESUME.

Michael: THAT'S RIGHT, YEAH.

Leo: YEAH.

IF YOU WERE RUNNING MENU
MASTER ON TIGER THAT'S EXACTLY
WHAT WOULD HAVE HAPPENED WHEN
YOU INSTALLED LEOPARD.

THERE ARE OTHER PROGRAMS IN
FACT YOU CAN SEE RIGHT HERE.

THEY PUT A LITTLE WARNING.

WARNING THERE ARE OTHER
PROGRAMS LIKE THAT.

BUT THIS IS APPLE'S ALWAYS
TOLD ME.

[Pop captions up]

Leo: WE YOU KNOW WE LOVE
UNSANITY, WE LOVE HAKSIES BUT
WE DO NOT GUARANTEE
COMPATIBILITY WITH FUTURE
VERSIONS OF OUR OPERATING SYSTEM.
AND THIS WAS, THIS WAS ONE
WHERE A LOT OF PEOPLE GOT BIT.

[Pop captions down]

Leo: THEY WERE RUNNING THIS
PROGRAM AND WHEN THEY UPGRADED
TO LEOPARD BLUE SCREEN OF
DEATH COULDN'T, COULDN'T
COMPLETE THE BOOT.

THERE IS GOOD NEWS THOUGH.

[Pop captions up]

Leo: THE WAY APPLE'S
INSTALLS WORK THERE'S ALWAYS

AN OPTION AND THIS FIRST THING
YOU SHOULD TRY BEFORE YOU DO
THE FORMAT IS THE, THE ARCHIVE
AND INSTALL OPTION.

[Pop captions down]

Leo: SO WHAT YOU DO IS OKAY

WE'RE CRASHED.

YOU SHUT DOWN THE MACHINE.

YOU PUT IN THE INSTALL DISK.

YOU START IT UP HOLDING DOWN

THE C KEY TO BOOT FROM THE CD.

THAT SHOULD WORK JUST FINE AND

THEN YOU START THE INSTALLER.

BUT INSTEAD OF DOING THE

UPGRADE YOU KNOW APPLE LIKE,

LIKE MICROSOFT WILL USUALLY

RECOMMEND THE UPGRADE IN PLACE

WHEN YOU MODIFY YOUR OPERATING SYSTEM.

THIS ALMOST ALWAYS IS A BAD

IDEA BECAUSE YOU'VE PROBABLY

GOT SOMETHING IN YOUR

OPERATING SYSTEM THAT WAS

INCOMPATIBLE OR IT JUST DOESN'T WORK.

SO ALMOST ALWAYS IT'S A BETTER

IDEA TO DO THE WHAT THEY CALL

THE ARCHIVE AND INSTALL.

AND WINDOWS JUST TAKES THE

SYSTEM FOLDER, RENAMES THE

PREVIOUS SYSTEM FOLDER MOVES

IT ASIDE.

IT DOESN'T TOUCH YOUR APPLICATIONS.

IT DOESN'T TOUCH YOUR DATA.

IT JUST PUTS A FRESH OPERATING

SYSTEM ON THERE.

SOME APPLICATIONS WILL ACT AS
IF THEY'VE NEVER BEEN INSTALLED.

SOME APPLICATIONS MIGHT NOT
RUN RIGHT.

THAT'S WHY YOU HAVE THAT
PREVIOUS SYSTEM FOLDER.

YOU CAN DRAG THEIR EXTENSIONS OVER.

BUT BY DOING THAT IT
ELIMINATES THINGS LIKE MENU
MASTER BECAUSE THAT THOSE
THINGS HAVE TO INSTALL AS
EXTENSIONS IN THE OPERATING
SYSTEM FOLDER.

SO IT SETS THOSE ASIDE AND
ALMOST ALWAYS THAT FIXES IT.

DID YOU TRY THAT?

Michael: I DID ACTUALLY TRY THAT.
IT WAS PART OF THE APPLE TECH
SUPPORT THEY DID RECOMMEND THAT.

Leo: YEAH.

Michael: AND AGAIN TO NO AVAIL.

Leo: YOU COULDN'T, YOU
COULDN'T START IT UP?

Michael: YEAH EVEN AFTER
THAT THE SAME THING.
THE COMPUTER WOULD BOOT.
IT WOULD GO THROUGH ALL THE -- STUFF.
AND I MEAN WE TRIED BOOTING IN
SAFE MODE UM STILL NOTHING.
AS SOON AS YOU HIT THAT LOG IN
SCREEN BOOM BEACHBALL, COULD
NOT EVEN ENTER A PASSWORD NOTHING.

Leo: WELL YEAH PROBABLY
WHAT HAPPENED WAS WELL
ACTUALLY I DON'T KNOW WHAT HAPPENED.
AND POSSIBLY WHAT HAPPENED --

Michael: YEAH.

Leo: IS DURING THE UPGRADE
SOMETHING HAPPENED TO THE HARD
DRIVE AT THAT POINT.
UM THEY MIGHT MAYBE THEY WERE RIGHT.
MAYBE YOU DID HAVE TO FORMAT
AND INSTALL.
UM YOU CAN ALWAYS GET THE DATA
OFF BY GOING INTO TARGET DISK MODE.
SO WHAT YOU KNOW HOW TO DO
THAT PROBABLY RIGHT?
YOU HOLD THE T DOWN.

Michael: THAT MUCH YEAH
THAT MUCH I DIDN'T KNOW.

Leo: YEAH SO NOW YOU CAN
GET THE DATA OFF ANYWAY THEN
FORMAT THE DRIVE.
WHAT I SUSPECT HAPPENED IS
THAT CONCURRENTLY WITH YOUR
INSTALL SOMETHING WENT WRONG
IN THE HARD DRIVE.
AND SO FORMATTING IT AND
REINSTALLING IT AT THAT POINT
DID THAT FIX IT?

Michael: AH YEAH DOING THE
FORMAT AND JUST A STANDARD
REINSTALL EVERYTHING WAS FINE.

Leo: YEAH.

Michael: AND THERE'S BEEN

NO, NO PROBLEM SINCE.

IT WAS JUST THAT ONE TIME.

Leo: MOST OF THE PROBLEMS
PEOPLE HAVE HAD WITH LEOPARD
ARE CAUSED STEM FROM DOING
THIS UPGRADE.

AND I DID IT BOTH WAYS JUST TO
SEE ON A VARIETY OF MACHINES
AND IT'S ALMOST ALWAYS BETTER
TO DO IT AT LEAST THE ARCHIVE
AND INSTALL.

HEY A CLEAN INSTALL, WHICH
MEANS FORMATTING THE DRIVE AND
INSTALLING IS, IS ALWAYS A
GOOD IDEA.

YOU GET RID OF EVERYTHING.

ON THE OTHER HAND IT'S A PAIN
CAUSE YOU HAVE TO BACKUP YOUR
DATA AND SO FORTH.

SO WELL IT'S EVERY, IT SOUNDS
LIKE EVERYTHING'S OKAY NOW.

Michael: IT IS. UM I ACTUALLY DID HAVE YET
ANOTHER QUESTION AS PART OF THIS.

UM ONE OF THE THINGS I WAS
GONNA TRY I NEVER GET AROUND
TO IT, IT WAS A CURIOSITY.
IS IF I WERE TO SAY BOOT THE
MACHINE WITH SAY AN UBUNTU LIVE --

Leo: MMM-HMM.

Michael: WOULD I BE ABLE TO
STILL ACCESS THE FILES?

Leo: UM I'M TRYING TO
REMEMBER IF THE QUESTION THE

ONLY QUESTION AT ALL IS CAN
THE UBUNTU LIVE CD SEE THE
MACINTOSH HFS FILE FORMAT?
THAT'S HOW THOSE DISKS ARE
FORMATTED.

Michael: RIGHT.

Leo: AND I'M TRYING TO REMEMBER.
I'VE DONE THIS.

I THINK IT CAN.

SO --

Michael: RIGHT.

Leo: SO THAT'S THE QUESTION
IF IT COULD SEE THE DRIVE YEAH
ABSOLUTELY.

IN FACT IN ALL LIKELIHOOD YOU
COULD BOOT FROM YOUR OS X DISK
AND SEE THE DRIVE UNLESS THE
DRIVE'S DAMAGED.

SO BOOT FROM YOUR INSTALL DISK.

Michael: OH RIGHT.

Leo: YOU SHOULD BE ABLE TO
SEE THE DISK AND COPY FILES OFF.

DO TARGET MODE AND THEN IT
JUST SHOWS UP AS A FIREWIRE

HARD DRIVE, COPY THE FILES OFF.

OR YEAH POSSIBLY IN UBUNTU AND

IT'S JUST REALLY A QUESTION OF

WHETHER UBUNTU UNDERSTANDS THE

HFS PLUS FILE SYSTEM AND I

SEEM TO REMEMBER THAT IT DOES.

Michael: OKAY GOOD TO KNOW.

Leo: YEAH THOSE ARE ALL

THREE OF THOSE WOULD BE VERY

USEFUL RECOVERY TECHNIQUES TO
USE IF YOUR HARD DRIVE DIES
AND YOU CAN'T BOOT INTO IT.
YOU CAN AT LEAST GET YOUR DATA
AND YOUR APPLICATIONS OFF.
THANKS FOR THE CALL MICHAEL.

Michael: OH.

Leo: I APPRECIATE IT.
HOW DO YOU LIKE LEOPARD NOW
THAT YOU'VE GOT IT RUNNING?

Michael: OH ONCE IT'S UP
AND RUNNING IT'S BEAUTIFUL.

Leo: YEAH.

Michael: REALLY GORGEOUS,
LOTS OF IMPROVEMENTS.

Leo: YEAH I, I LOVE IT TOO.
THERE ARE SOME ISSUES PEOPLE
ARE HAVING WITH IT.
BUT IN GENERAL I THINK LEOPARD
IS A BIG IMPROVEMENT.
THANKS FOR THE CALL MICHAEL.

[Both talking at once]

Michael: SURE OKAY.

Leo: I'M GLAD YOU GOT IT
ALL WORKING.

Michael: ALL RIGHT THANKS.

Leo: NOW LET'S TAKE A WALK
OVER TO RYAN YEWELL.
IT'S TIME FOR YEWELL'S JEWELS!

Ryan Yewell: IT IS.

WELL THANK YOU FOR THE INTRO.

Leo: YES.

Ryan Yewell: AH WE'RE ON WINDOWS.

WE ARE DOING OXYGEN OFFICE PROFESSIONAL.

Leo: OXYGEN?

Ryan Yewell: OXYGEN.

Leo: I'VE NEVER HEARD OF THIS.

Ryan Yewell: WELL

ESSENTIALLY WHAT IT IS, IT'S

OPEN OFFICE.

Leo: MMM-HMM.

[Pop captions up]

Ryan Yewell: BUT IT'S VALUE ADDED.

Leo: OH NEAT.

Ryan Yewell: SO ESSENTIALLY

YOU GET MORE CLIPART.

YOU GET SOME TEMPLATES.

Leo: OH LOOK AT ALL THE

STUFF YOU GET IN THAT.

[Pop captions down]

Ryan Yewell: YEAH.

SO HERE I'M JUST SHOWING OFF

SOME OF THE DIFFERENT CATEGORIES.

SO YOU'VE GOT PHOTOS UP TOP

AND IT'S GOING THROUGH THEM.

[Pop captions up]

Leo: OPEN OFFICE IS AN OPEN

SOURCE VERSION OF MICROSOFT OFFICE.

Ryan Yewell: YES.

Leo: REASON WRITE MICROSOFT

OFFICE FILES, IT HAS A

SPREADSHEET, WORD PROCESSOR, POWERPOINT.

[Pop captions down]

Ryan Yewell: RIGHT.

Leo: ALL OF THE STUFF THAT OFFICE HAS.

Ryan Yewell: IT'S ALSO A

YEWELL'S JEWEL AS WELL.

Leo: YEAH.

Ryan Yewell: SO --

Leo: THIS IS AN IMPROVED VERSION.

Ryan Yewell: IT, IT JUST
ADDS MORE CLIPART AND THE TEMPLATE.

Leo: LOOK AT ALL THE CLIPART.

Ryan Yewell: THERE'S A LOT
OF CLIPART, SOME MORE FONTS
AND ALSO IF I GO UP HERE I GO FILE.
I GO NEW AND I CHECK TEMPLATES
AND DOCUMENTS IT'S JUST GOT A
LOT OF MORE TEMPLATES.
WE'VE GOT BUSINESS CORRESPONDENCE.

Leo: OH THAT'S NICE.

Ryan Yewell: EDUCATION SO
YOU CAN GO IN THERE AND YOU'VE
GOT BUSINESS CARDS
YOU'VE GOT UP --

Leo: IS IT UP TO DATE WITH
OPEN OFFICE IN TERMS OF VERSIONS?

Ryan Yewell: YEAH THIS ONE IS 2.3.1 I BELIEVE.

Leo: OKAY.

Ryan Yewell: SO THEY'RE
TRYING TO KEEP UP SO THAT
IT'S, SO THAT THE UPDATES IN
OPEN OFFICE.
THEN THEY MAKE IT OVER ONTO
OXYGEN SO.

Leo: SO IT SOUNDS LIKE
THERE'S NO REASON NOT TO
INSTALL OXYGEN INSTEAD OF OPEN OFFICE.

Ryan Yewell: YEAH, YEAH IT'S --

Leo: CAUSE THEN YOU GET ALL
THIS EXTRA STUFF WITH --

Ryan Yewell: EXACTLY.

Leo: NO, NO PENALTY.

Ryan Yewell: THERE YOU GO EXACTLY.

Leo: AND IT'S FREE.

Ryan Yewell: AND IT'S ABSOLUTELY FREE.
I WOULDN'T BE TALKING ABOUT IT
IF IT WASN'T FREE.

Leo: NO HE DOESN'T TALK
ABOUT STUFF.

Ryan Yewell: COME ON YOU
SHOULD KNOW ME BY NOW.

Leo: I'VE NEVER HEARD HIM
TALK ABOUT SOMETHING THAT'S
NOT FREE.

Ryan Yewell: I KNOW I'M A CHEAPSKATE.

Leo: WHETHER IT'S LUNCH, SOFTWARE.

Ryan Yewell: THAT'S RIGHT.

Leo: IT DOESN'T MATTER.

Ryan Yewell: FIRST IN LINE, LAST TO PAY.
THAT'S ME.

[Leo laughing]

Leo: RYAN YEWELL'S JEWELS ARE ONLINE WHERE?

[Pop captions up]

[Blank for boards]

Ryan Yewell: GO THERE. I'LL SEND YOU THIS ONE.
LINK TO IT, MORE LOTS OF GOOD ONES.

Leo: AND NO CHARGE TO USE
THE WEBSITE EITHER.

Ryan Yewell: NO IT'S FREE AS WELL.

Leo: NO ABSOLUTELY FREE.
I DON'T KNOW HOW WE DO IT.

Ryan Yewell: YOU'VE GOT TO
PROBABLY PAY YOUR INTERNET
SERVICE PROVIDER TO GET THERE THOUGH.

Leo: YEAH SEE SOMEBODY,
THERE'S ALWAYS SOMEBODY TAKING.

Ryan Yewell: IF I COULD
FIND A FREE INTERNET SERVICE
PROVIDER I WOULD BE KING I THINK.

Leo: I MEAN GOOGLE STICK AROUND.
I THINK GOOGLE MIGHT BE
GETTING IN THAT BUSINESS, YOU WATCH.

Ryan Yewell: YOU THINK?

Leo: YOU WATCH, YOU WATCH.

Ryan Yewell: IF IT DOES
MAYBE YEWELL'S JEWELS.

Leo: IT COULD BE A GOOGLE
FREE GOOGLE YOU BET.

Ryan Yewell: OKAY COOL.

Leo: THANK YOU RYAN.

Ryan Yewell: YOU'RE WELCOME.

Leo: COMING UP RIGHT NOW
FRANK LINHARES.
HE'S GONNA DEMYSTIFY RAID, RAID!
THAT MULTIPLE DISK SOLUTION
THAT IS GREAT FOR SPEED,
RELIABILITY, BACKUP.
WE'LL FIND OUT MORE IN JUST A BIT.

Ryan Yewell: COOL.

Leo: BEFORE WE GO THOUGH
LET'S GIVE YOU ONE MORE CHANCE
TO TAKE OUR QUICK QUIZ
QUESTION OF THE DAY.
HOW DO --

[Blank for boards]

Leo: WELL IT'S --

[Blank for boards]

Leo: NO I BEG TO DIFFER. ITS --

[Blank for boards]

Leo: AH YOU'RE CRAZY.

IT'S THE SAME WAVEFORM ADDED
TO INVERT THE POLARITY.

OH NO!

YOU JUST --

[Blank for boards]

Leo: WHAT IS IT?

CHOOSE YOUR FAVOURITE CHARACTER.

WE'LL FIND OUT WHEN "THE LAB" CONTINUES.

[MUSIC]

[Pop captions down]

[Commercial break]

[MUSIC]

[Pop captions up]

Leo: WELCOME BACK TO "THE LAB".

BEFORE THE BREAK WE ASKED YOU --

[Blank for boards]

Leo: AND I BELIEVE THEY

BLOCK THE NOISE WITH VERY LOUD SILENCE.

NO THEY DON'T.

THEY ADD THE SAME WAVEFORM BUT
THEY INVERT THE POLARITY SO
THE WAVEFORMS CANCEL AND ALL
OF A SUDDEN YOU'RE HEARING NOTHING.

Frank Linhares: YEAH.

Leo: IT MOSTLY WORKS.

Frank Linhares: YEAH.

Leo: THEY HAVE MICROPHONES ON EM.

Frank Linhares: YEAH.

Leo: THEY GET THE SOUND
THAT'S COMING IN FROM THE JET NOISE.
THEY INVERT IT SO THAT YOU
KNOW YOU'VE GOT A SOUNDWAVE
LIKE THIS AND THE OTHER ONE'S
LIKE THAT.

THEY MATCH THE HUMP TO THE
BUMP AND THEN BOOM POOF-SHHHT.

Frank Linhares: THE HUMP TO THE BUMP?

Leo: I JUST MADE THAT UP.

Frank Linhares: ALL RIGHT.

Leo: FRANK LINHARES IS HERE.
HE IS THE CO-HOST AND PRODUCER
OF DIGITALUNDERGROUND.TV.
A LOVELY PLACE WHERE YOU CAN
LEARN ALL SORTS OF STUFF LIKE
WE'RE ABOUT TO SHOW YOU.
WE ACTUALLY ASKED HIM IN TO
DEMYSTIFY SOMETHING CALLED RAID!
WHAT IS RAID BESIDES BUG SPRAY?

Frank Linhares: THERE IS,
THERE'S AN UNDERLYING DEBATE
AS TO WHAT THE ACTUAL PROPER
NAME OF IT IS.
IT'S EITHER REDUNDANT ARRAY OF
INEXPENSIVE DISKS OR A
REDUDANT ARRAY OF INDEPENDENT DISKS.

[Pop captions down]

Leo: OKAY.

Frank Linhares: EITHER
WHICH WAY IT'S, IT'S A BUNCH
OF DISKS OKAY.

Leo: THEY ARE INDEPENDENT.

Frank Linhares: THEY ARE.

Leo: AND USUALLY THEY'RE
IN, INEXPENSIVE SO.

Frank Linhares: USUALLY I
MEAN THE OLD WAYS --

[Both talking at once]

Leo: BUT IT STILL WORKS
EVEN IF THEY WERE REALLY EXPENSIVE.

Frank Linhares: EXACTLY SO.

Leo: SO I GUESS THEY'RE
PROBABLY INDEPENDENT IS
PROBABLY THE BETTER WAY.

Frank Linhares: TRUE, TRUE.

Leo: SO RAID COMBINES
MULTIPLE DISK DRIVES TO DO WHAT?

Frank Linhares: TO CREATE
ONE BIG ARRAY OR ONE BIG VOLUME.
NOW THERE ARE, THERE'S A BUNCH
OF DIFFERENT RAID LEVELS.

WHAT I'M GONNA TALK ABOUT
TODAY IS THE THREE PRIMARY
ONES, WHICH IS RAID 0, RAID 1
AND RAID 5.

Leo: OKAY.

[Pop captions up]

Frank Linhares: NOW YOU CAN
BUY UNITS LIKE THIS FROM D-
LINK THAT'S THE FRONT OF IT
THAT HOUSE MULTIPLE UNITS.

[Pop captions down]

Leo: SEE IT HAS ROOM FOR
TWO HARD DRIVES, GOT IT.

Frank Linhares: TWO HARD DRIVES IN THERE.

Leo: YEAH.

Frank Linhares: AND THIS

UNIT ACTUALLY HAS A BUILT IN

RAID CONTROLLER.

NOW RAID IS, IS USUALLY

PERFORMED AT THE HARDWARE LEVEL.

Leo: RIGHT.

Frank Linhares: SO IT'S

USUALLY A CARD OR SOMETHING

IN, IN THE ACTUAL ENCLOSURE

DOES THIS.

NOW THIS SPECIFIC UNIT HAS TWO

DRIVES WHICH SO THIS WOULD BE

RAID 0, RAID 1.

RAID 0 IS SOMETHING THAT I

DON'T RECOMMEND FOR ANYONE.

NOW ALL RAID --

Leo: WHAT IS, WHAT IS RAID 0?

Frank Linhares: IT'S JUST,

IT'S ESSENTIALLY IT'S JUST A

BUNCH OF DISKS.

IS WHAT IT DOES IT TAKES BOTH DISKS.

Leo: IT KIND OF MAKES --

Frank Linhares: IT KIND OF USES ALL OF THE SPACE.

Leo: IT A BIG SIZE.

Frank Linhares: ONE BIG SIZE.

SO YOU GOT --

Leo: SO YOU'VE GOT YOUR TWO

50S IN THERE YOU GET --

Frank Linhares: 100.

Leo: 100 GIGABYTES.

Frank Linhares: BUT YOU GET

NO REDUNDANCY, NO NOTHING AND THEN --

Leo: AND, AND THIS IS THE
PROBLEM IS IF YOU HAVE TWO
DRIVES ONE OF THEM IS LIKELY
TO FAIL.

Frank Linhares: THAT'S RIGHT.

Leo: AND THAT SO YOU HAVE
TWICE THE LIKELIHOOD OF LOSING.
AND IF ONE DIES THEY BOTH DIE.

Frank Linhares: WELL ESSENTIALLY YOU'RE, YOU'RE
THAT'S IT.

[Both talking at once]

Leo: YOU LOST IT.

Frank Linhares: -- SO IT'S GOT TO BE CHUCKED.

Leo: SO YOU'RE KIND OF
INCREASING YOUR CHANCE OF
LOSING YOUR DATA.

Frank Linhares: THAT'S RIGHT, THAT'S RIGHT.

Leo: OKAY.

Frank Linhares: NOW THERE'S
ALSO RAID 1 WHICH THIS UNIT
DOES WHICH IS MIRROR.

Leo: MIRROR.

Frank Linhares: SO WE'VE
GOT TWO DRIVES OF EQUAL SIZE.
LET'S SAY WE'VE GOT TWO 500
GIGABYTE DRIVES IN HERE.
WHATEVER'S ON ONE IS
AUTOMATICALLY MIRRORED TO THE OTHER.

Leo: SO THE DRIVE MECHANISM
IS WRITING TO BOTH AT THE SAME
TIME ALL THE TIME.

Frank Linhares: EXACTLY, EXACTLY.

Leo: SO IF ONE DIES YOU
STILL HAVE YOUR DATA.

Frank Linhares: THAT'S RIGHT.
YOU CAN PULL IT OUT, REPLACE
IT WITH A NEW ONE.

AH I DON'T KNOW IF THIS EXACT
UNIT IS, IS DOES HOT SWAPPING,
WHICH MEANS PULLING THE DRIVE
OUT WHILE ITS ACTIVE.

BUT ONCE YOU PUT THE NEW DRIVE
IN IT WILL START THE REBUILD
PROCESS AND PUT ALL THE DATA
BACK ON IT --

[Both talking at once]

Leo: SO SOME RAID SYSTEMS
YOU HAVE TO POWER DOWN BEFORE
YOU PUT IN A NEW DRIVE.

Frank Linhares: THAT'S RIGHT.

Leo: AND SOME THE ONES THAT
ARE EXPENSIVE DESIGNED FOR SERVERS --

Frank Linhares: YEAH
USUALLY THAT'S RIGHT.

Leo: WHERE THEY DON'T EVER
WANT TO BE DOWN YOU CAN
ACTUALLY WHILE IT'S RUNNING --

Frank Linhares: YOU CAN
LITERALLY JUST PULL IT OUT AND
PUT A NEW DRIVE IN.

Leo: WHICH IS A SCARY THING
TO DO I'M GONNA TELL YOU.

Frank Linhares: YEAH IT'S
NOT RECOMMENDED BUT WHAT CAN
YOU DO?

UM I ACTUALLY --

Leo: THAT'S 1 AND 0?

Frank Linhares: THAT'S 1 AND 0.

Leo: AND WE BY THE WAY WHEN YOU HAVE A MOTHERBOARD THAT HAS RAID THAT'S USUALLY YOUR CHOICE IS 1 OR 0.

Frank Linhares: 1 OR 0 YEAH SOMETIMES --

Leo: SOMETIMES THEY 0 PLUS 1 WHICH MEANS YOU GET A LITTLE BIT OF BOTH.

[Laughs]

Frank Linhares: A LITTLE BIT OF BOTH. WELL I WOULDN'T RECOMMEND IT EITHER. YOUR BEST BET IF YOU REALLY WANT TO KEEP YOUR DATA SAFE, SECURE, RELIABLE AND, AND REAP ALL THE BENEFITS OF THE SPEED GAIN OF RAID IS RAID 5.

Leo: RAID 5.

Frank Linhares: RAID 5.

Leo: 5.

Frank Linhares: NOW WHAT 5 DOES IS KIND OF IT DOES A LITTLE BIT OF BOTH.

Leo: YEAH.

Frank Linhares: SO YOU CAN TAKE LET'S SAY FOUR DRIVES, FOUR 500-GIGABYTE DRIVES AND YOU'LL EFFECTIVELY USE 75% OF THAT TOTAL SPACE. SO YOU'VE GOT IT'S, IT'S MIRRORED AND STRIPED ACROSS --

Leo: OKAY.

Frank Linhares: ACROSS ALL THE DRIVES.

SO IF ANY ONE OF THESE DRIVES
ACTUALLY IF, IF YOU'RE RUNNING
FOUR IF ANY TWO OF THOSE
DRIVES DIES AT THE EXACT SAME
TIME YOU CAN PULL EM OUT AND
REPLACE EM.

Leo: WOW THAT'S PRETTY COOL.

Frank Linhares: RIGHT SO

YOU'RE GETTING THE BENEFIT OF BOTH.

Leo: DOES RAID 5 REQUIRE FOUR DRIVES?

Frank Linhares: NO IT DOESN'T REQUIRE --

Leo: IT CAN RUN ON TWO?

Frank Linhares: NO IT CANNOT RUN ON TWO,
MINIMUM THREE.

Leo: AT LEAST THREE.

Frank Linhares: MINIMUM THREE.

Leo: OKAY, OKAY.

Frank Linhares: UM AND YOUR
OTHER ALTERNATIVE IS SOFTWARE RAID.
A LOT OF LINUX DISTRIBUTIONS
HAVE SOFTWARE RAID --

Leo: RIGHT.

Frank Linhares: BUILT INTO IT.

[Pop captions up]

Frank Linhares: NOW WITH,
WITH SOFTWARE RAID YOU CAN GO
MINIMUM THREE RIGHT UP TO A
HUNDRED DRIVES.

Leo: MMM-HMM.

Frank Linhares: IF YOU ACTUALLY WANT TO.
YOU MIGHT NOT WANT TO DO THAT.

[Both talking at once]

Frank Linhares: IT'D KIND OF HARD TO FIND A COMPUTER --

[Both talking at once]

Leo: I'M KIND OF A FAN OF HARDWARE RAID 5.

[Pop captions down]

Frank Linhares: THE BEST WAY.

Leo: MOST NETWORK ATTACHED
STORAGE DEVICES DO THAT.

Frank Linhares: THAT'S RIGHT.

Leo: THERE ARE OTHER
DEVICES LIKE THE DROBO WE WERE
TALKING ABOUT THAT ESSENTIALLY
EMULATE RAID 5.

Frank Linhares: YEAH, YEAH
THEY'RE ALL PROPRIETARY AH, AH
KIND OF THING.

Leo: BECAUSE IT WORKS THE SAME.

Frank Linhares: IT WORKS THE EXACT SAME WAY.

Leo: YEAH.

Frank Linhares: YOU'RE, YOU'RE, YOU'RE MIXING DATA
ACROSS IT.

[Pop captions up]

Frank Linhares: YOU'RE STRIPING SOME OF THE BITS
ACROSS ALL THE DRIVES AND IF
ANY ONE DIES ANY TWO DIES IF --

Leo: THAT'S REALLY GREAT.

Frank Linhares: YOU HAVE FOUR OR MORE.

Leo: RIGHT.

Frank Linhares: THEN YOU CAN YOU'RE, YOU'RE SAFE.
IT'S THE BEST BET IN KEEPING
ALL YOUR DATA OR ANY BACKUPS
INTACT AND NOT HAVING TO WORRY
ABOUT ANYTHING DYING.

[Pop captions down]

Leo: DIGITALUNDERGROUND.TV.

IS THIS THE KIND OF THING YOU

TALK ABOUT ON THERE?

Frank Linhares: THIS IS THE

KIND OF STUFF WE TALK ABOUT YEAH.

Leo: SEE THAT'S WHAT I THOUGHT.

[MUSIC]

Frank Linhares: YEAH WE DO --

[Pop captions up]

Leo: IT'S DIGITAL AND IT'S

UNDERGROUND AND IT'S TV AND

IT'S AT --

[Blank for boards]

Frank Linhares: THAT'S RIGHT.

Leo: AND FRANK LINHARES IS

THE HOST AND PRODUCER AND THIS

IS GOOD TO KNOW.

THIS RAID STUFF IS, IS, IS

KIND OF MIGRATING DOWN TO END

USERS FROM THE OLD DAYS OF THE

BIG DATA STORAGE FACILITIES.

Frank Linhares: THAT'S RIGHT.

Leo: BUT IT'S ACTUALLY VERY

USEFUL AND GOOD TO KNOW --

[Both talking at once]

Frank Linhares: YEAH IT'S --

Leo: NOW THAT WE HAVE A LOT OF DATA.

Frank Linhares: IT'S THE

BEST WAY TO KEEP YOUR DATA

WITHOUT QUESTION.

Leo: AND WE ALL HAVE

TERABYTES OF DATA IT SEEMS

LIKE NOWADAYS.

Frank Linhares: YEAH, YEAH TV SHOWS.

Leo: HE CAME ALL THE WAY
OUT FROM THE BIG SNOW.

THANK YOU FRANK FOR JOINING US TODAY.
YOU KNOW IT'S SNOWING BACK THERE.

Frank Linhares: PLEASE
DON'T REMIND ME.

Leo: IT'S REALLY SNOWING.
IT'S LIKE POURING DOWN SNOW.

Frank Linhares: IT WAS A BLIZZARD LAST WEEK.

Leo: IT'S LIKE EIGHT FEET
LIKE YOU CAN'T YOU WOULD WALK
AND YOU WOULD JUST IT'S TERRIBLE.

Frank Linhares: I GOT FIVE
FEET ON MY, ON MY LAWN OF SNOW.

Leo: DID YOU REALLY?

Frank Linhares: REALLY.

Leo: OH.

Frank Linhares: THERE'S,
THERE'S FIVE FEET OF SNOW ON
MY LAWN.

Leo: I WANT TO GO THERE.

Frank Linhares: YEAH.

Leo: AND DIG A TUNNEL AND
WE COULD HAVE A FORT.
AND YOU WANT TO HAVE A
SNOWBALL FIGHT?

Frank Linhares: YOU CAN SEE
ALL MY, MY CHRISTMAS
DECORATIONS JUST GLOWING IN
THE SNOW YEAH.

[Leo laughing]

Leo: YOU DON'T SEE THEM

JUST THE GLOW.

Frank Linhares: JUST THE

GLOW, THE WHITE UGLY GLOW.

Leo: OH MAN.

ALL RIGHT WE'RE GONNA TAKE A

BREAK AND COME BACK.

MORE OF YOUR CALLS IN JUST A SECOND.

WHAT WRAP IT UP WE'RE DONE?

COME ON.

I WANT TO DO SOME MORE CALLS.

NO?

ALL RIGHT.

WELL WE'LL WRAP IT UP THEN.

WE'LL DO MORE CALLS TOMORROW

AS "THE LAB" CONTINUES.

YOU STAY RIGHT HERE.

DONE?

[MUSIC]

[Commercial break]

[MUSIC]

Leo: WELCOME BACK TO "THE LAB".

WE'RE OUT OF TIME.

Kate: I KNOW.

Leo: IT SEEMS LIKE WE

SHOULD HAVE MORE CALLS, MORE GUESTS.

Kate: HONESTLY TODAY IT'S

JUST FLOWN BY.

Leo: THERE WERE JUST SO

MANY THINGS IN THIS SHOW.

Kate: CRAZY.

Leo: I'VE LEARNED SO MUCH.

Kate: YES INDEED YOU HAVE.

Leo: IN FACT DURING THE
COMMERCIAL I LEARNED A FEW
THINGS I WISH I HADN'T LEARNED.
BUT THAT'S ANOTHER STORY FOR
ANOTHER TIME.

[Laughs]

Kate: WE DON'T TALK ABOUT IT.

[Leo laughing]

Leo: KATE ABRAHAM THANK YOU
SO MUCH FOR BEING HERE.

Kate: THANK YOU.

Leo: I WANT TO THANK OUR
GUEST FRANK LINHARES.

Kate: YES.

Leo: WHO CAME ALL THE WAY
OUT FROM SNOWY TORONTO.

Kate: I KNOW TORONTO --

Leo: JUST TO SHOW US RAID.

Kate: TORONTO IS VERY SNOWY
AT THE MOMENT.

Leo: YEAH WE GOT SOME
PICTURES FRIENDS WOW.

Kate: IT'S LIKE HERE.

Leo: STEVE GIBSON CAME ALL
THE WAY UP FROM SUNNY IRVINE,
CALIFORNIA.

Kate: IT SOUNDS LOVELY.

Leo: SO BOTH OF THEM, FRANK
GOT A GOOD DEAL AND STEVE GOT
A LOUSY DEAL.
AND THEN WHAT WAS IT LIKE IN
CLEVELAND DR., DR. EXCEL?

Kate: DR. EXCEL.

Leo: I PROMOTED YOU.

Kate: HE PROMOTED YOU.

[Both laugh]

Leo: WAS IT SNOWING?

Bill Jelen: COLD.

Leo: COLD BUT NOT SNOWING.

ALL RIGHT SO THANK YOU FOR COMING OUT.
IT'S GREAT.

WE HAVE PEOPLE COMING FROM ALL
OVER THE WORLD JUST TO SEE US.

Kate: EXACTLY WE BRING YOU
INTO THE RAIN.

Leo: YEAH.

[Pop captions up]

Leo: IF YOU WANT TO BE ON
THE SHOW YOU COULD FLY IN OR --

Kate: OH ABSOLUTELY AND --

Leo: USE SKYPE.

Kate: OH YEAH GO TO
LABWITHLEO.COM-FORWARD-SLASH
TECH QUESTIONS.

IF YOU SUBMIT YOUR QUESTION
NOW, I WILL PHONE YOU GET YOU
ON THE SHOW.

WE WILL ANSWER ALL YOUR WORRIES.

Leo: EXCEPT DON'T ASK ME
ABOUT PIVOT TABLES.

CAUSE I STILL --

Kate: WE DON'T USE THOSE.

Leo: NO MATTER WHAT MR.
EXCEL SAYS I STILL DON'T
UNDERSTAND A THING.

[Pop captions down]

Kate: PHOOF.

Leo: ABOUT, ABOUT PIVOT
TABLES AT ALL.

Kate: IT IS CRAZY.

Leo: YOU KNOW HE COMES IN
AND ABOUT ONCE A YEAR HE TRIES
TO TEACH ME HOW PIVOT TABLES WORK.
AND I, AND I YOU KNOW IT SEEMS EASY.
IT'S LIKE THESE PHOTOSHOP GUYS.
YOU LOOK AT IT YOU GO OH YEAH I GOT IT.
I GOT IT.
I COULD TOTALLY DO THAT.

Kate: YES.

Leo: AND THEN YOU GO HOME
AND YOU GO I DON'T GET IT.

Kate: I DON'T GET IT.

[Both laugh]

Leo: I DON'T GET IT AT ALL.
I DON'T UNDERSTAND IT.

[Pop captions up]

Leo: WE HOPE A LITTLE BIT
OF THIS STUCK BETTER WITH YOU
THEN WITH ME AND WE ARE SO
GLAD YOU WERE HERE.
WE HOPE YOU WILL COME BACK TOO.

Kate: PLEASE DO.

Leo: WE LIKE TO DO THIS
EVERY SINGLE DAY.
PLEASE JOIN US AGAIN.
TELL YOUR FRIENDS.
YOU KNOW WHERE TO FIND US "THE
LAB WITH LEO".
AH SO DO YOU WANT TO GO SHOVEL

SOME SNOW?

Kate: I WOULD TO GO SHOVEL SOME.

LET'S GO PLAY IN THE SNOW.

Leo: HUH?

Kate: LET'S GO PLAY IN THE SNOW.

Leo: I WANT TO HAVE A FORT
AND A SNOWBALL FIGHT AND THE
WHOLE THING.

Kate: LET'S DO IT.

[Pop captions down]

Leo: COME ON FRANK'S HOUSE EVERYBODY!

LET'S GO.

WE'LL SEE YOU LATER ON "THE LAB", BYE-BYE.

[MUSIC]

[Coins bouncing]

[MUSIC]

[Pop captions up quickly]

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[Pop captions down]