

 MTIN Consulting


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US MUM 2017

J2SW.COM





TOPICS COVERED

- MPLS - WHAT YOU NEED TO KNOW
 - NETWORK DESIGN PHILOSOPHIES
 - LESSONS LEARNED ON THE OL INTERWEBS
 - WHAT YOU NEED TO KNOW IN THE NEXT 18 MONTHS
 - EXTRAS IF TIME
 - GIVEAWAY
- 

JUSTIN WILSON



- CCNA – CCNP – COMTRAIN - MTCNA
- ISP INDUSTRY SINCE 1993
- BLOGGER, THE BROTHERS WISP MEMBER, COMMUNITY REGULAR
- CEO MTIN.NET, COO MIDWEST-IX/FD-IX
- AVID GI JOE COLLECTOR

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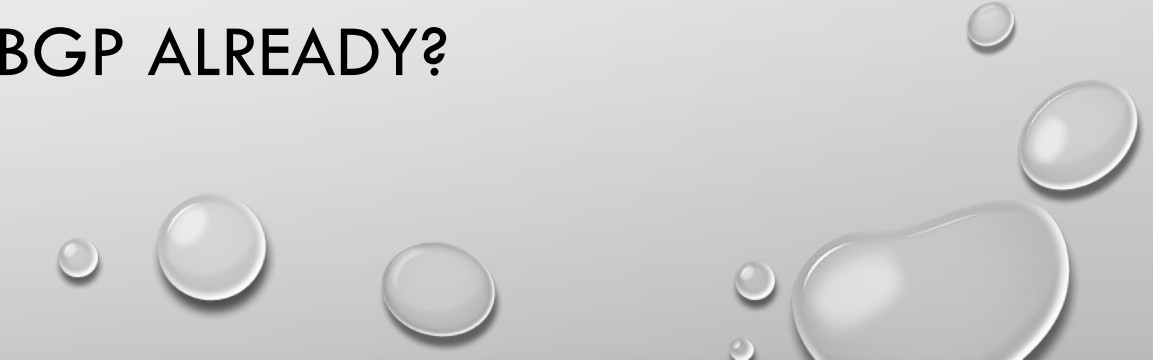
MPLS / VPLS / ALPHABET SOUP

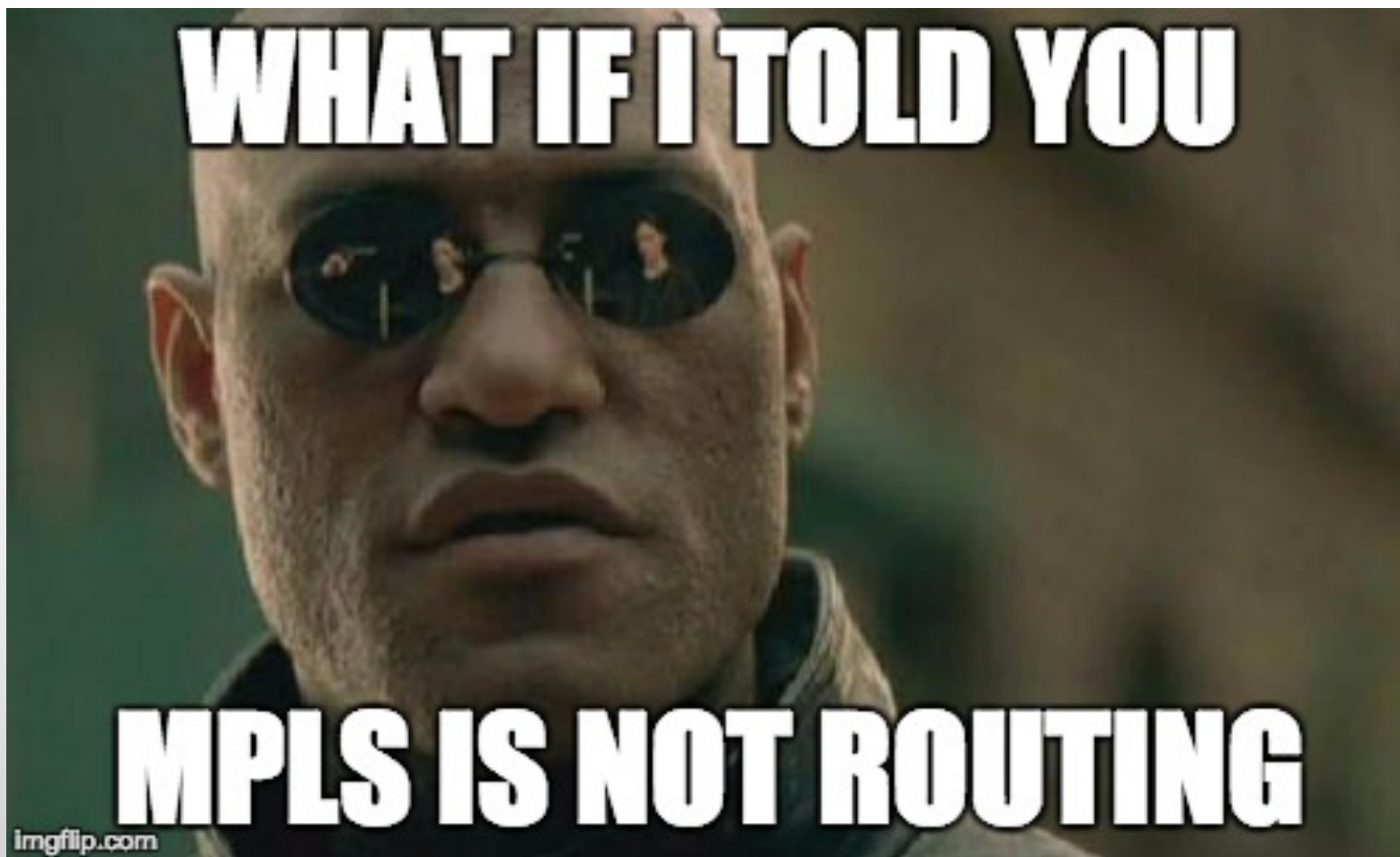
- MPLS
- VPLS
- WHY AND WHEN?





WHY SHOULD I EVEN CARE ABOUT MPLS?

- SCALABILITY
 - TRAFFIC ENGINEERING
 - QOS
 - REDUNDANCY
 - INDEPENDENT OF LAYER 2 AND LAYER 3 PROTOCOLS
 - BUT I CAN DO THIS WITH OSPF AND BGP ALREADY?
- 



MPLS...

- **MPLS IS LAYER 2.5**


- YOU STILL NEED THINGS LIKE OSPF, BGP, EIGRP FOR IP
- IF YOU ARE RUNNING RIP COME SEE ME. YOU NEED HELP. I WILL HELP YOU FOR FREE YOU POOR B@\$%!RD.

- **ARE STATIC ROUTES BAD?**

- NO, JUST NOT SCALABLE
- IF YOU ARE RUNNING STATIC ROUTES COMFORTABLY YOU PROBABLY DON'T HAVE A NEED FOR MPLS



DRAWBACKS TO MPLS

- MORE ADMINISTRATIVE OVERHEAD
 - LARGER MTUS NEEDED
 - INCREASED NETWORK COMPLEXITY
 - CHANGE IS SCARY
 - DO I REALLY NEED MPLS?
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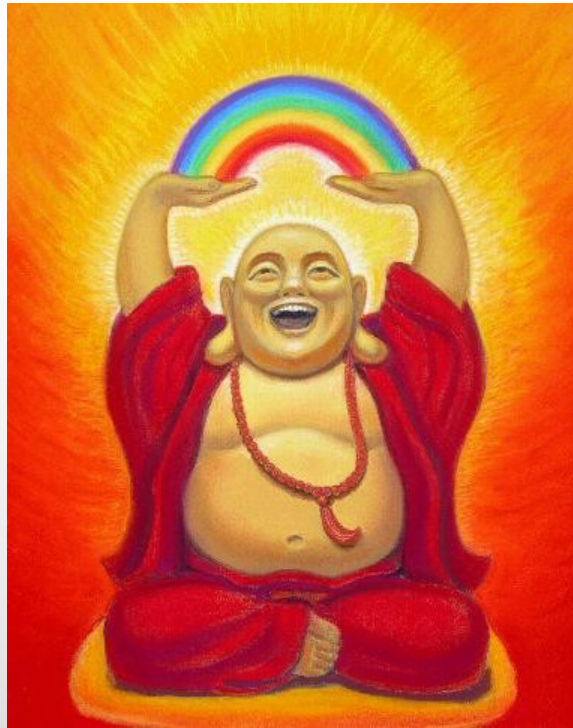
MPLS SECURITY

- EASY TO SPOOF IP ADDRESSES, ALMOST IMPOSSIBLE TO SPOOF LABELS
 - EVERY PE ROUTER MAINTAINS A SEPARATE BR
- DOES NOT DO ENCRYPTION OR AUTHENTICATION
- MOST ATTACKS ARE AGAINST THE PE ROUTER OR THE ROUTING ON TOP OF MPLS

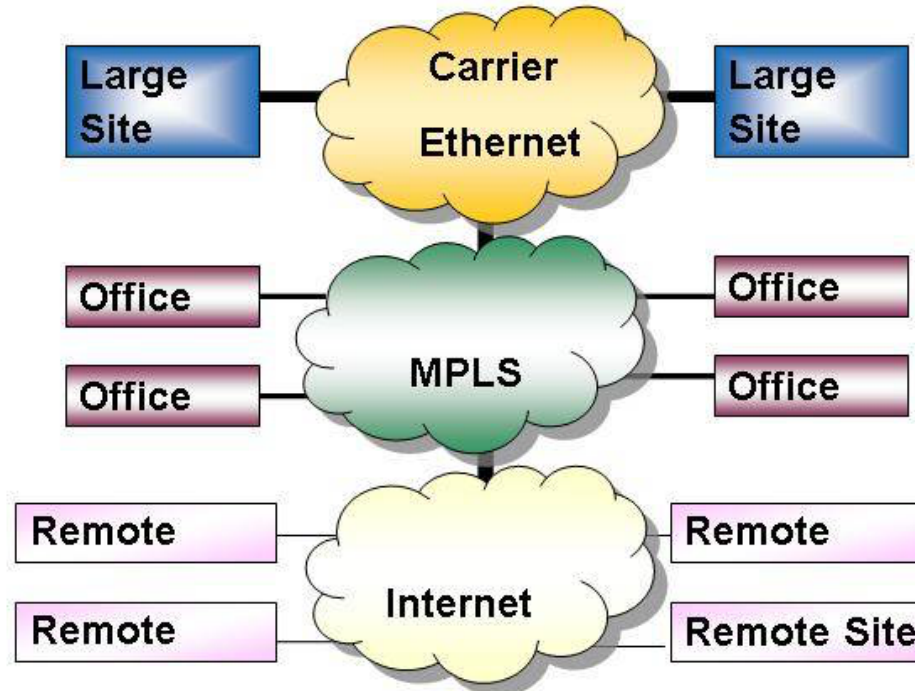
VPLS

- VPLS CAN HELP YOU SAVE IP ADDRESSES
- TUNNEL BACK TO A CENTRAL CORE WHERE A SINGLE POOL CAN ASSIGN IPS
- WILL EOIP DO THE SAME FOR ME?

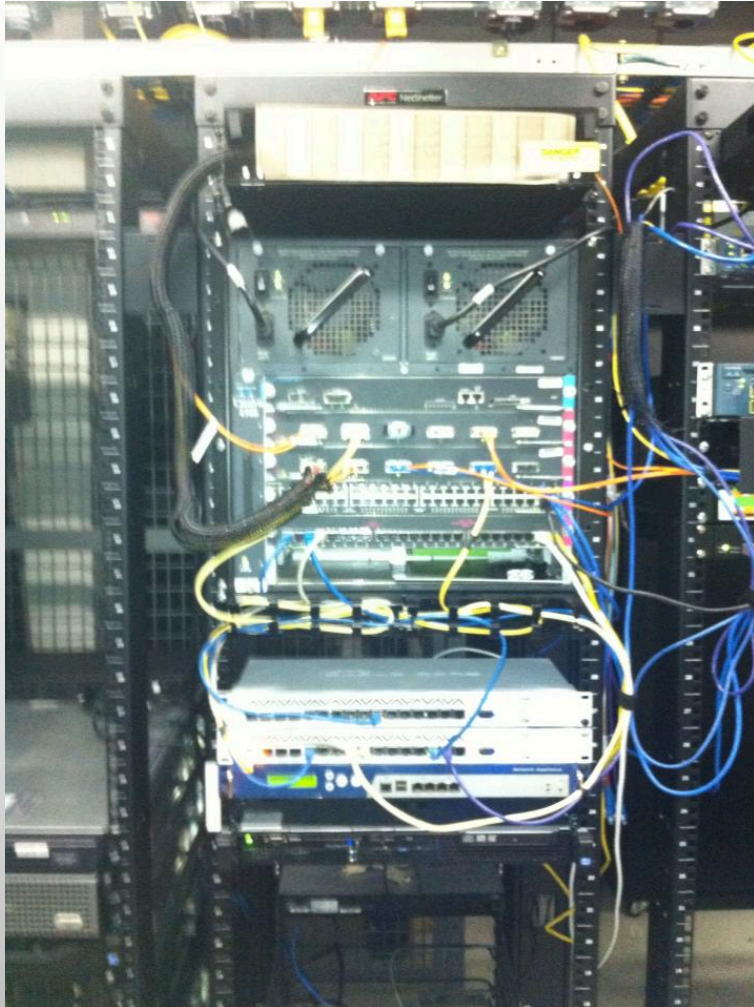
NETWORK PHILOSOPHY



WHERE TO USE?



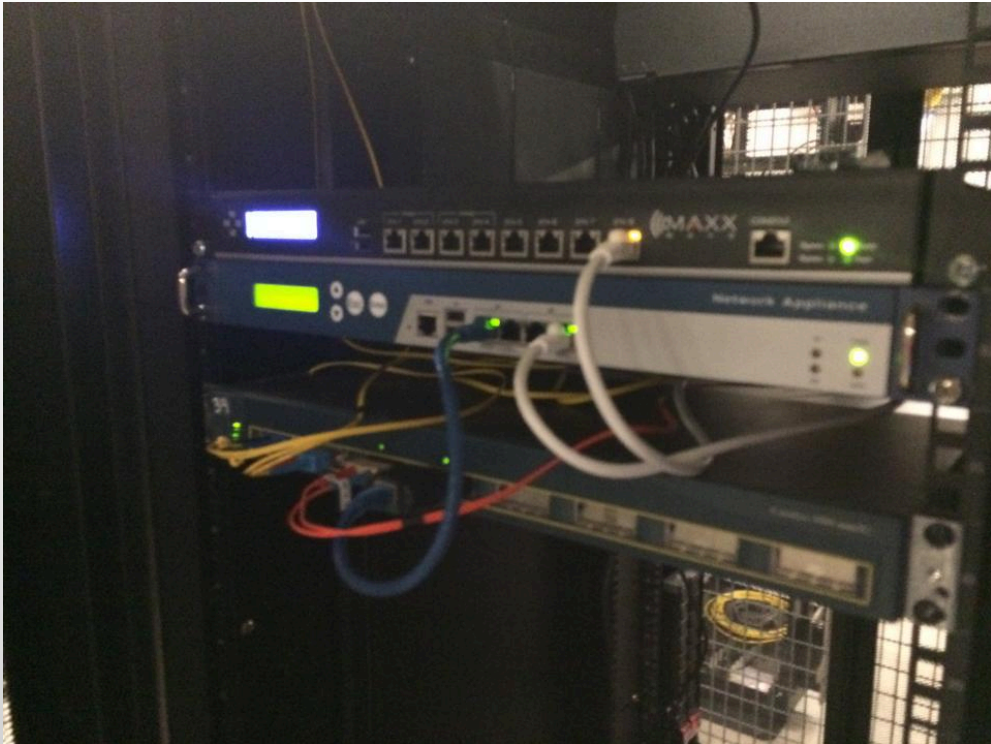
SWITCH CENTRIC



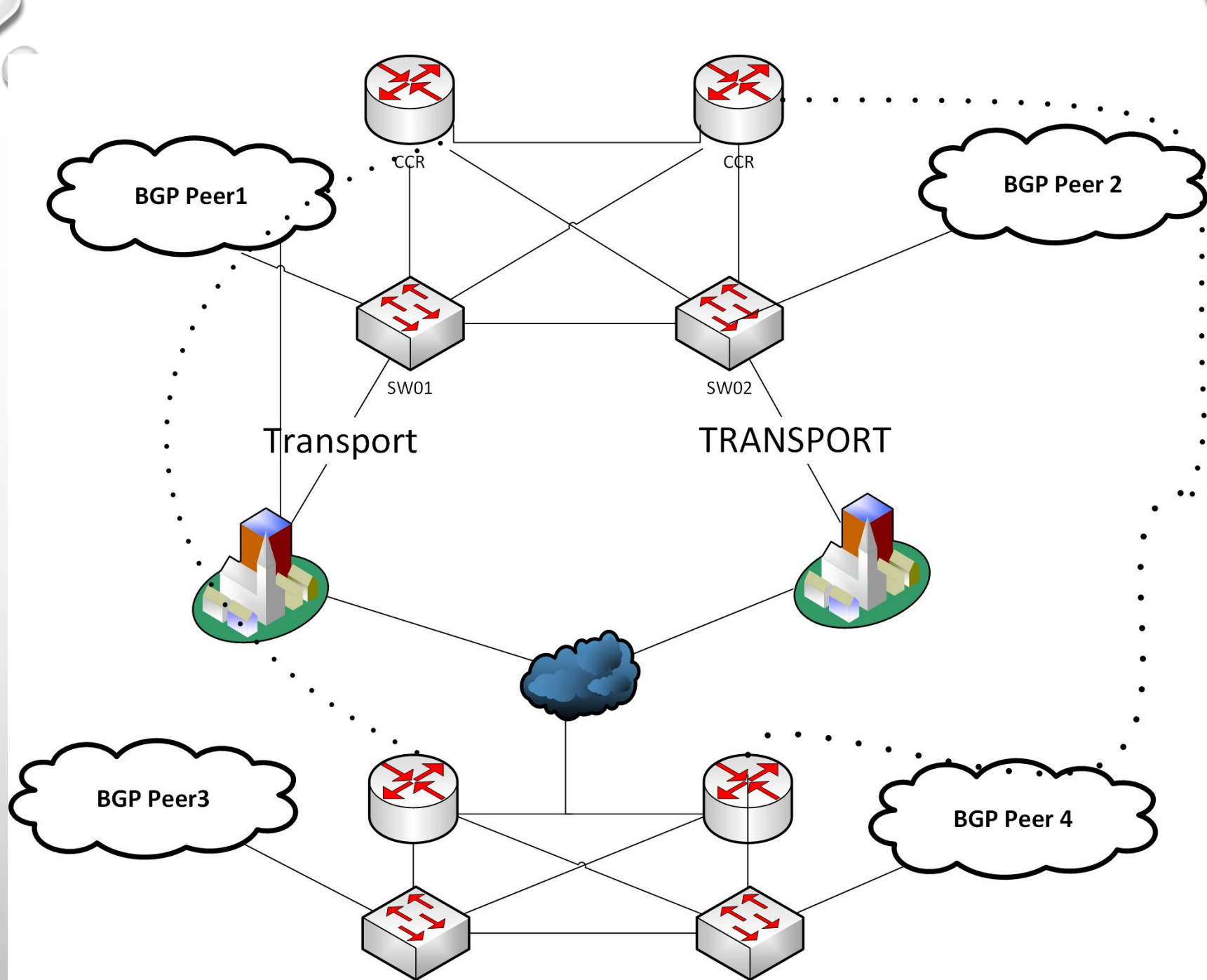
- Switch Fabric from 2013
- Transport and Transit circuits terminated on Cisco Chassis (pre mikrotik switching)
- Routers in VRRP
- BGP routers fed into VRRP Core
- Switches Switch Routers Route

uptime is 3 years, 7 weeks, 4 days,
this control processor is 3 years, 7
ned to ROM by power-on

SMALL SWITCH CENTRIC




- Small DC Deployment
- Same concept
- Switches switch
- Provider circuits are your failure points most of the time





WHAT DOES IT COST TO PLAN


- PLAN FOR 100 CUSTOMERS, PLAN FOR 10000
 - YOU CAN PLAN WHILE EATING GREEN EGGS AND HAM
 - SUCCESSFUL ISPS AND NETWORKS HAVE CONTINGENCY PLANS FOR EVERYTHING NOT JUST DISASTERS
 - KNOW YOUR PAIN POINTS
 - KNOW YOUR LIMITATIONS
- 

WHAT SHOULD I KNOW IN THE NEXT 12 MONTHS?





WHAT DO I NEED TO LEARN ABOUT?

- WIRELESS
 - LTE
 - SHRINKING CELL SIZES
 - MORE BANDWIDTH CLOSER TO THE CUSTOMER
 - INTERFERENCE MITIGATION
- 

IPV4 EXHAUSTION


- CGN
- IPV6
- OPEN MARKET PURCHASES
- NAT *



*WWJD (What would Janis do)



MIKROTIK STUFF TO KNOW

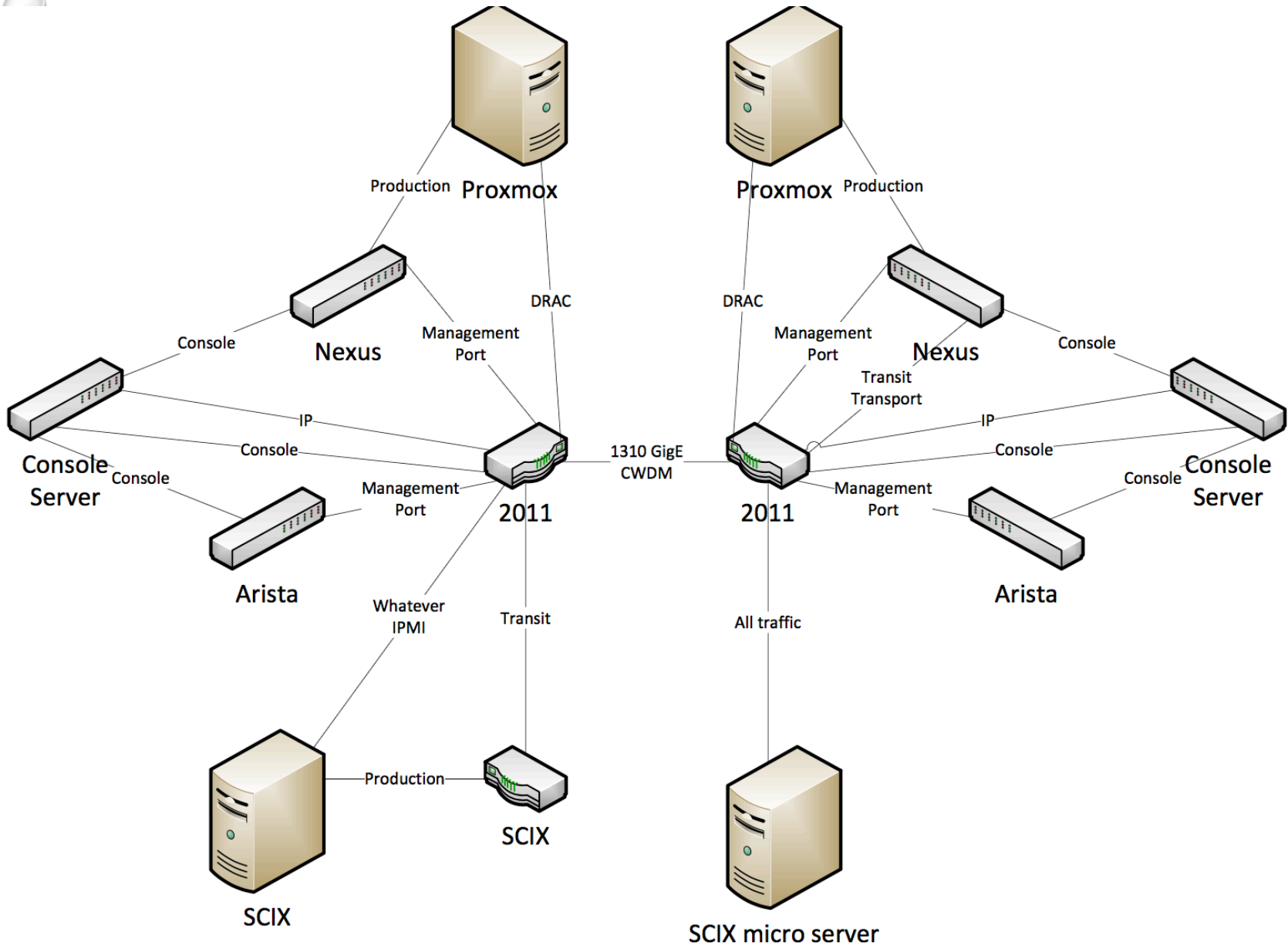
- FOR US PROVIDERS CALEA
 - AUTOMATING YOUR NETWORKS
 - EIRP LIMITS AND WIRELESS
 - LEARN ABOUT 60 GHZ, EVEN IF YOU ARE RURAL
- 

LLFF (LESSONS LEARNED FROM FACEBOOK)

- PROTECT YOUR NETWORK DEVICES. EVEN IF THEY ARE PROTECTED BY FIREWALLS KEEP UP ON SOFTWARE UPDATES. *
- GROUND YOUR STUFF....PROPERLY
- THERE ARE MANY WAYS TO DO SOMETHING. MANY ARE RIGHT. SOME ARE TOTALLY WRONG.
- MODULAR NETWORKS

MIKROTIK CASE STUDY

- SWITCHES AND ROUTERS IN A DATA CENTER 4 HOURS AWAY FROM THE CLOSEST TECH
- NEEDED TO BE ABLE TO SEE WHAT IS GOING ON BEFORE DISPATCHING SOMEONE
- MULTIPLE METRO SITES
- 2011S AT THE HEART OF THE MANAGEMENT NETWORK



RESOURCES

- FACEBOOK GROUPS (WISP TALK MOST ACTIVE)
- CONFERENCES
 - MUM
 - WISPA
- SERVICES AND PROGRAMS
 - UNIMUS
 - TOWERCOVERAGE
- PODCASTS
 - THE BROTHERS WISP
 - PACKET PUSHERS





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