

Wireless: Controller-Based Traffic Flows

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Agenda



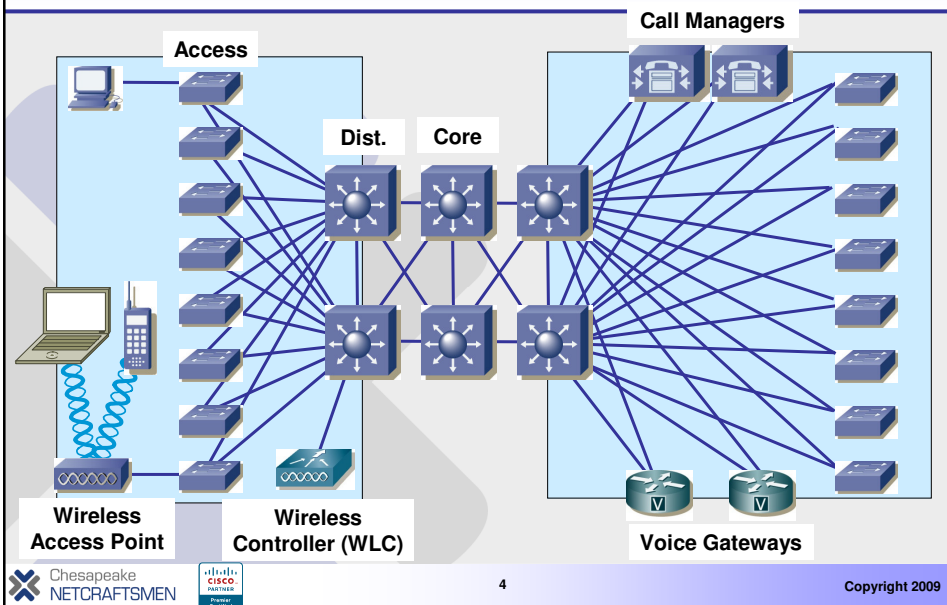
- WLAN Traffic Flows
- High-Level Troubleshooting Thoughts
- Summary

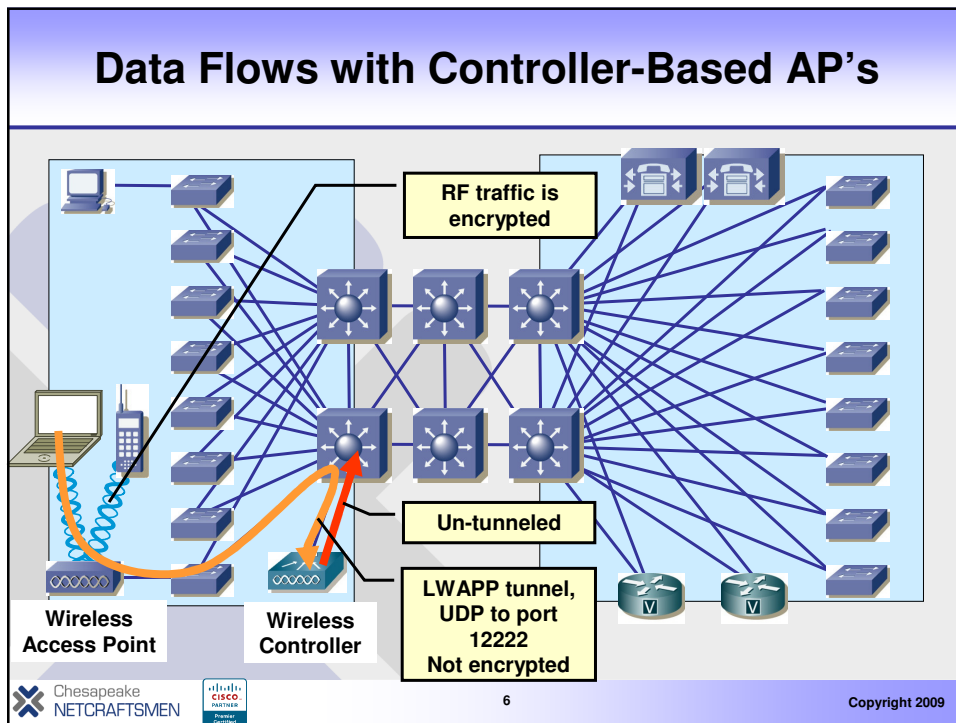
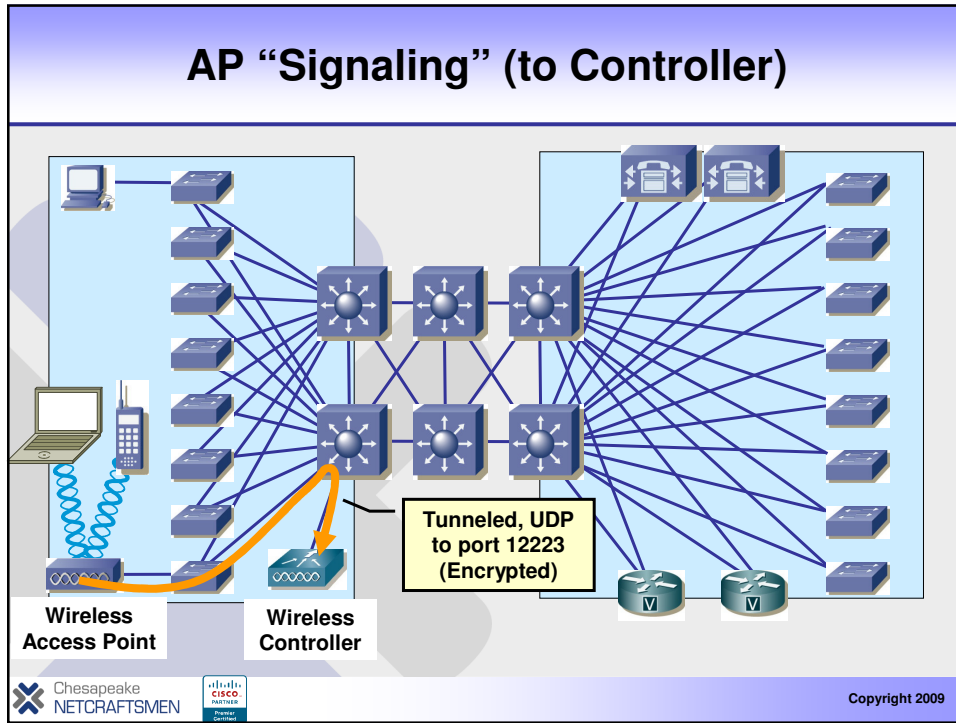
Why Look at Flows?

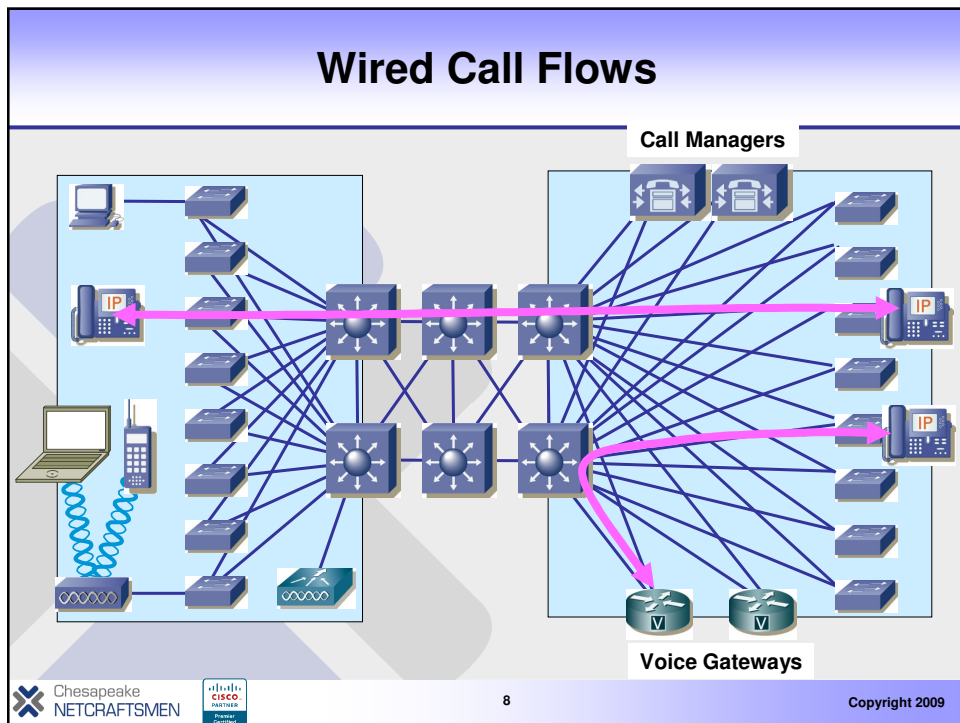
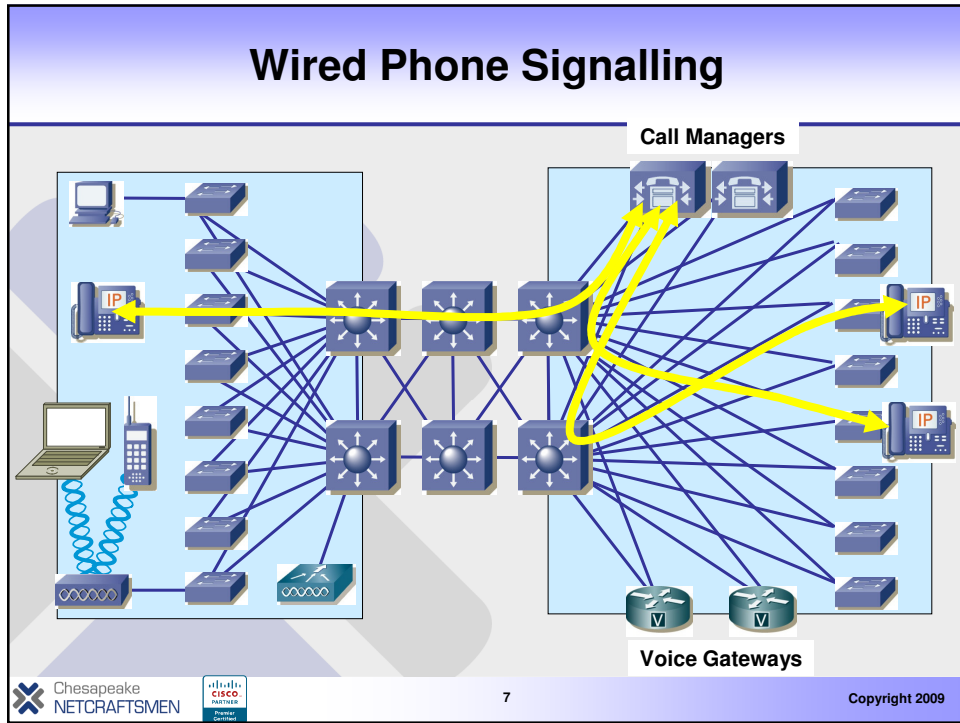
- (A) Review
- (B) Big picture for troubleshooting!
 - Sure, experts know the flows in more detail
 - But this level is often enough for troubleshooting at the top level
 - If you know there is an AP to WLC signaling issue, you then need debug and process steps to figure out what is failing (if not general packet loss)

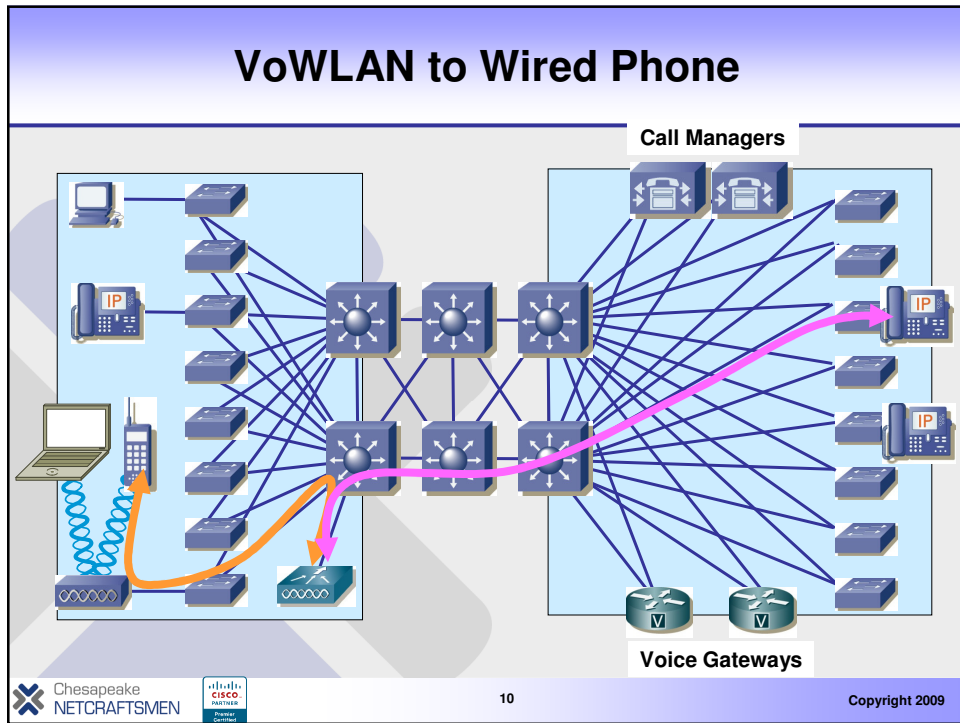
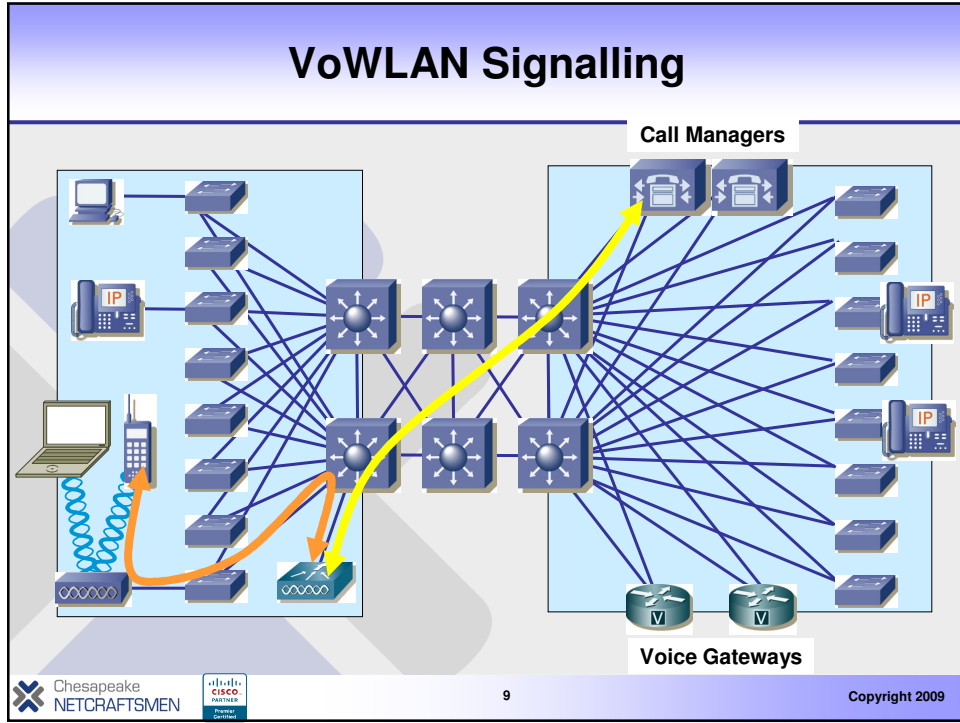
The Enterprise Network (Simplified)

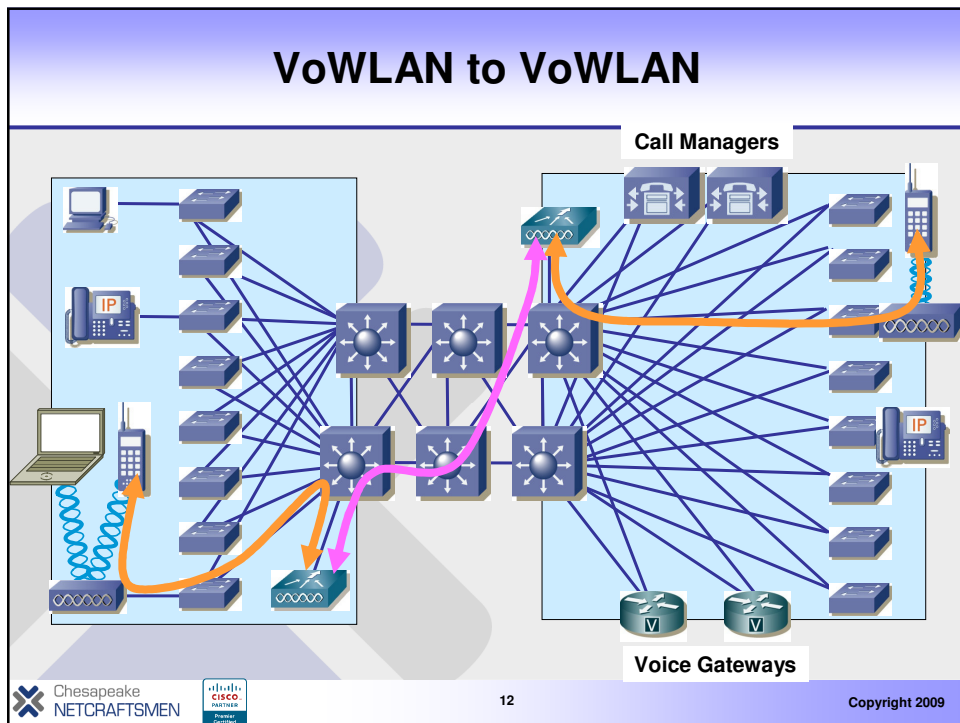
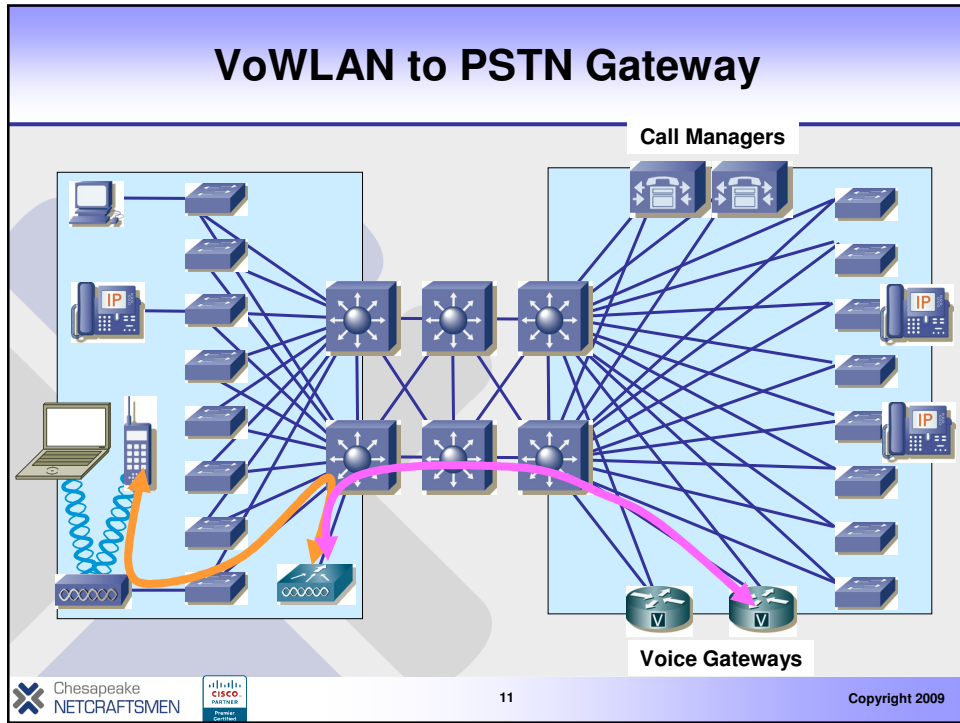
Cisco product names used, but...

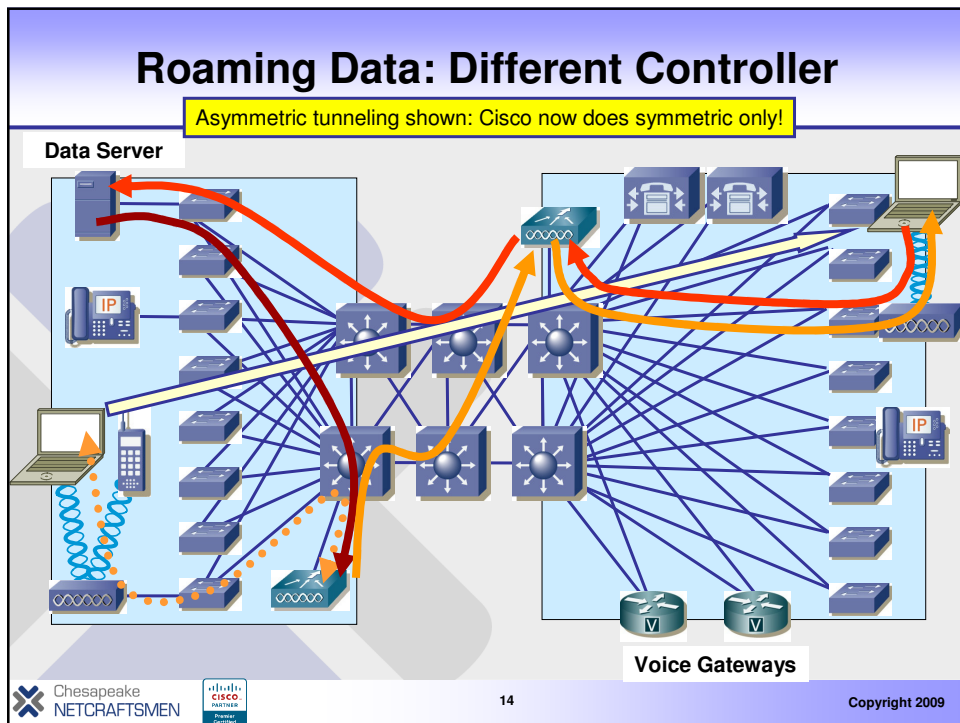
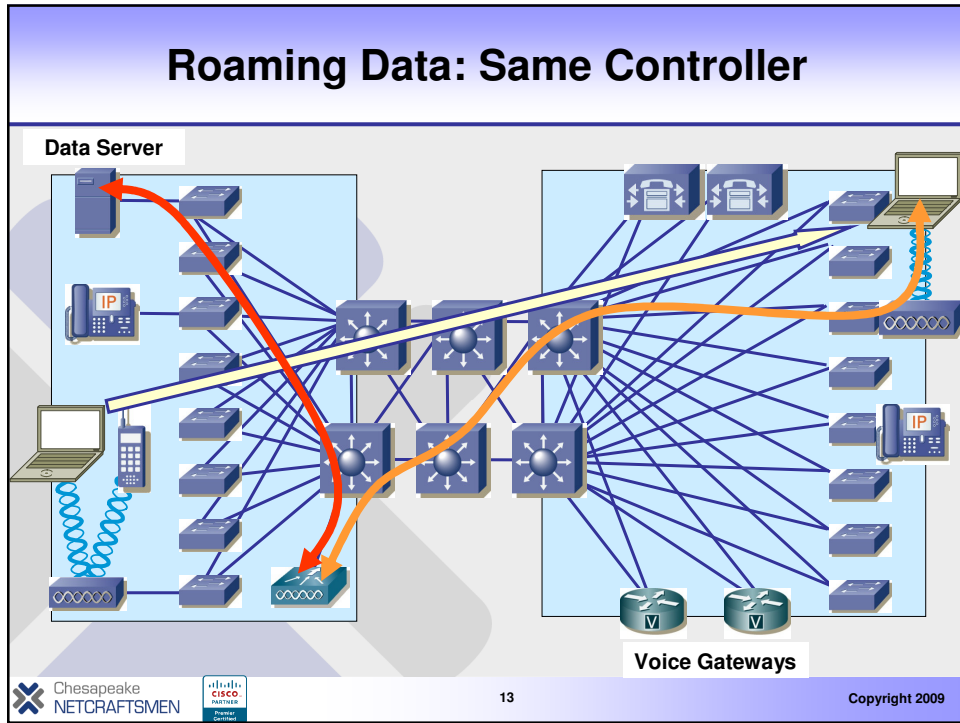


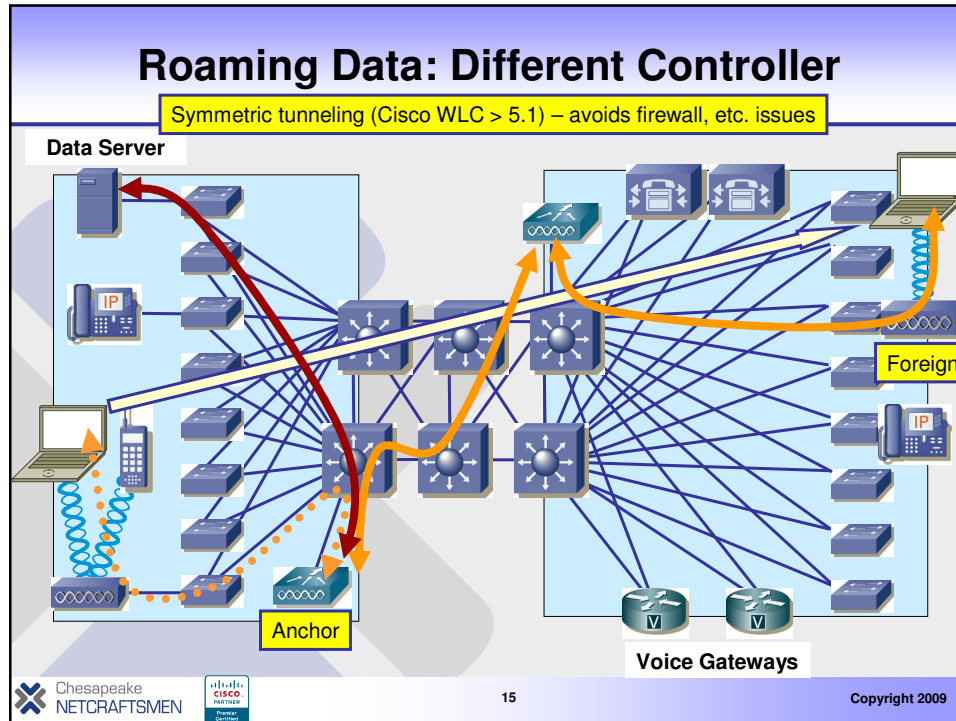












Roaming with VoWLAN

- **Similar, but flow is between two IPT devices rather than PC and server**
- **Reminder: roaming needs a smooth handoff**
 - Don't want to drop the call
 - Phone must smoothly associate with new AP
 - Potential delays: credentials & authentication, RADIUS, DHCP
 - Cisco controller tunnels back to original controller, to speed authentication process, avoid re-DHCP delay, re-authentication / RADIUS delay as well
- **The fact that traffic from the other end back to the WPhone goes via the original (home) WLC means:**
 - There is probably extra delay
 - Troubleshooting is more complex, e.g. packet capture
- **And how about TWO Roaming Wireless Phones?**

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QoS and VoWLAN

- The Wireless Phone signaling traffic (shown) and the media traffic (not shown) need appropriate QoS, wherever in the path – inside or outside the tunnel
- How do you tell what tunneled traffic is signaling (or media)?
 - Trust the markings from tunnels
 - Tunnels end at a WLC: known address(es)

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Guest with DMZ Anchor

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Notes

- **Some modes of operation allow for local switching onto Ethernet by the AP**
 - Cisco H-REAP / “locally bridged MAC” (esp. for remote sites)
 - Trapeze “Smart Mobile”
- **In such case, the traffic is NOT tunneled from the AP back to the controller**

Agenda



- **WLAN Traffic Flows**
- **High-Level Troubleshooting Thoughts**
- **Summary**

Be Aware of AP “Downtime”

- Any time the AP is scanning channels for neighbors or rogues, it is not passing traffic
- You need to be aware of any AP monitor intervals
 - When monitoring, the AP periodically briefly “stops serving clients” to monitor neighbors and do a channel scan
- This is one reason why dedicated APs or other devices can be beneficial for WLAN security

Troubleshooting Data or VoWLAN

- Scope the problem:
 - Wired PCs / phones also affected?
 - Specific PCs / phones, or whole building or floor?
 - PC to anywhere, PC to certain servers?
 - Wireless phone to wired phone, wireless phone to wireless phone, only wireless phone to VoGW?
 - Signaling problem or media problem?
 - Is it a connectivity, poor call quality, or a QoS issue?
- Check other information sources
 - Syslog
 - Network management tools
 - WCS or other WLAN event log
 - Call Manager records

Troubleshooting WLAN – 2

- Make sure it is a wireless-only problem before you start trouble-shooting it
- Need to find out where the user was when the problem occurred, other info (time of day, number of people, number of wireless phones nearby: **scope**: is there a pattern?)
- **Your WLAN / VoWLAN has a lot of moving parts**
 - Wireless & Wired LAN components, Cisco SecureACS, CUCM (Call Manager), Wireless & Wired QoS, and the phones themselves.
 - Become proficient in the key elements

Design for Troubleshooting

- **Observed:**
 - Packet capture to troubleshoot a VoWLAN quality issue can be challenging
 - Redundant switches and asymmetric wired flows can complicate packet capture
 - The problem: the participating devices are scattered, many at the distribution layer in buildings or in the data center
- **Relevant nodes:**
 - Phone handset(s)
 - AP(s)
 - Call Manager
 - Unity server
 - Voice Gateways
 - Wireless LAN Controllers (WLC's)
- **Could put all the “servers” in the same location?**
 - There are advantages to WLC's distributed among buildings
 - And to non-distributed Call Managers (i.e. in the Data Center)
- **Be prepared to use techniques other than packet capture wherever possible**

Summary

- **“Know your flows or go troubleshoot slow!”**
- **When troubleshooting WLAN / VoWLAN, getting good scope information from the user is especially critical!**
 - Who, when, where
 - What (symptoms)?
 - Get callback info in case user device needs to be checked (i.e. scope appears to be single device)
 - Have interference scanning capability in case the problem affects users in one area (especially intermittently)

Any Questions?

