



Cisco 200/300/500 Series Switches Unique Auto-voice capabilities

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US Pat: 8867405

“Cisco has raised the bar for this product category”
– Kevin Tolly, Founder, The Tolly Group

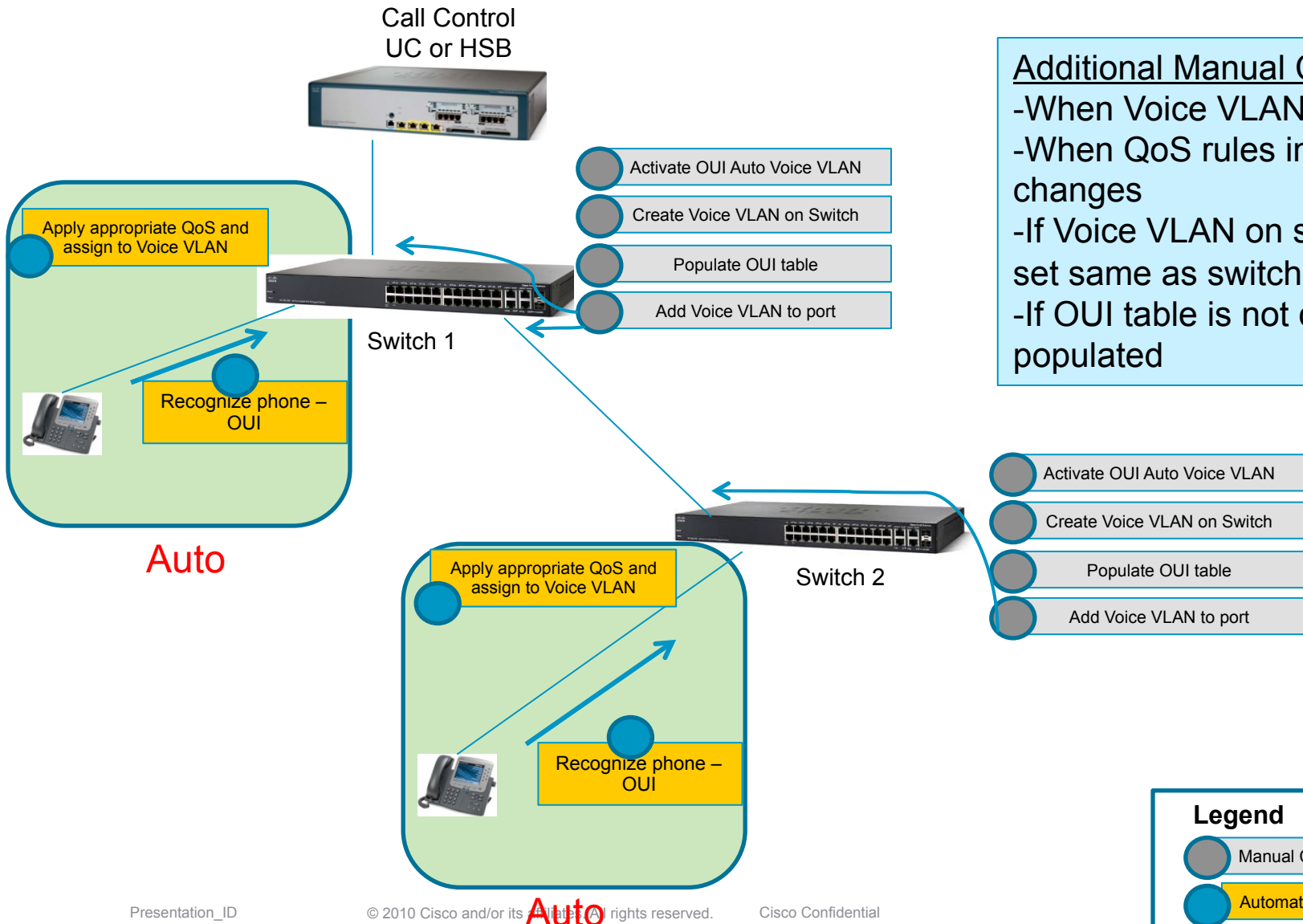
Unique Zero Touch Deployment

- Network-wide zero touch Voice Deployment
- Uniquely address **both** auto config for voice endpoints, APs, UC, desktops/ servers and the network of switches
 - Competitors (HP, H3C, Netgear, D-Link, Avaya, Nortel, Extreme) support auto config only for voice endpoints and only at network edge
- Detects endpoints connected
 - Automatically configures switch port correctly
 - Instructs phones VLAN and QoS to use
- Network converges on, and automatically adjusts to:
 - Voice VLAN changes
 - QoS changes
 - Multiple Call Control sources in the network (Voice VLAN of 1 source will be used)
 - Mis-configurations around Voice VLAN or QoS
- Use a combination of CDP, LLDP-MED, VSDP (Voice Services Discovery Protocol), Auto Smartports, and mDNS
- Supported on Cisco 200, 300, and 500 series switches

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Auto Voice VLAN– OUI approach

Supported on HP, Netgear, D-Link, H3C switches – also Cisco 200/300



Additional Manual Config:

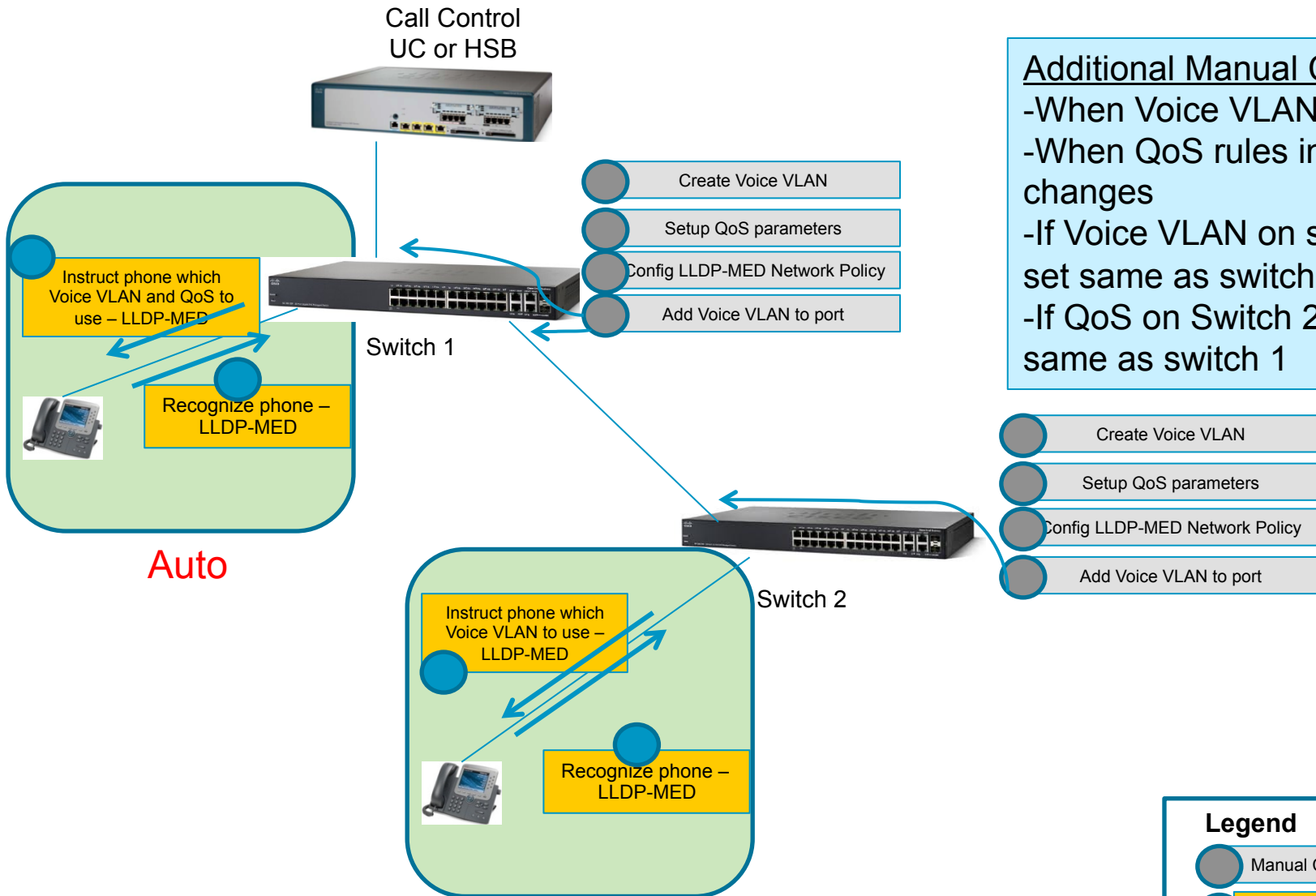
- When Voice VLAN changes
- When QoS rules in network changes
- If Voice VLAN on switch 2 not set same as switch 1
- If OUI table is not correctly populated

Legend

- Manual Config
- Automatic setup

Auto Voice VLAN – using LLDP-MED

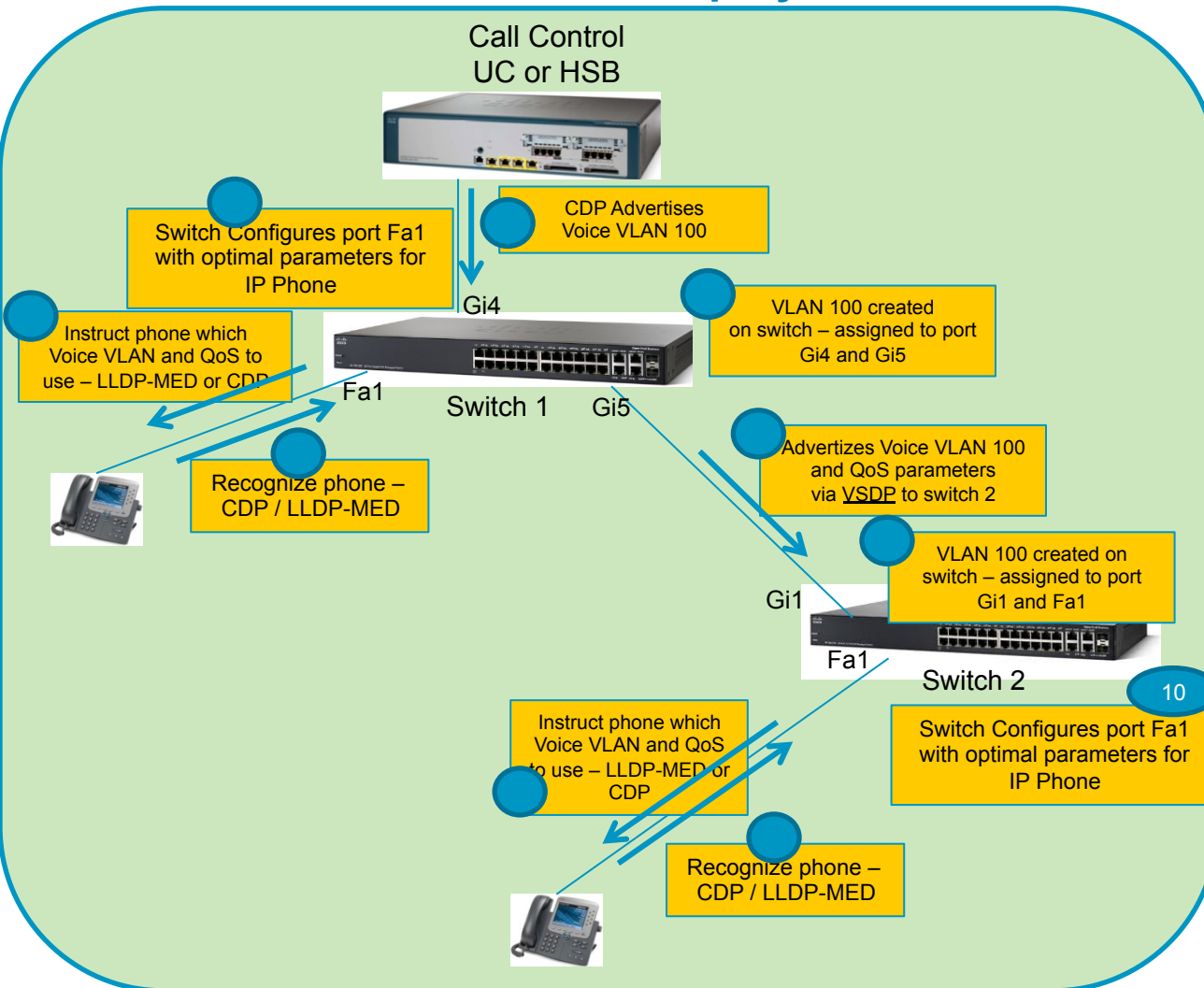
Supported on Avaya, Nortel, Extreme – also supported on Cisco 200/300



Auto Voice deployment across network

Supported only with Cisco 500, 300 and 200 switches

True zero touch deployment



NO MANUAL CONFIG

Network adapts automatically to:

- Voice VLAN changes
- QoS rule changes in network
- If Voice VLAN on switch 2 not set same as switch 1
- If QoS on Switch 2 not set same as switch 1

Even when different call control devices advertizing different Voice VLANs connected to the network

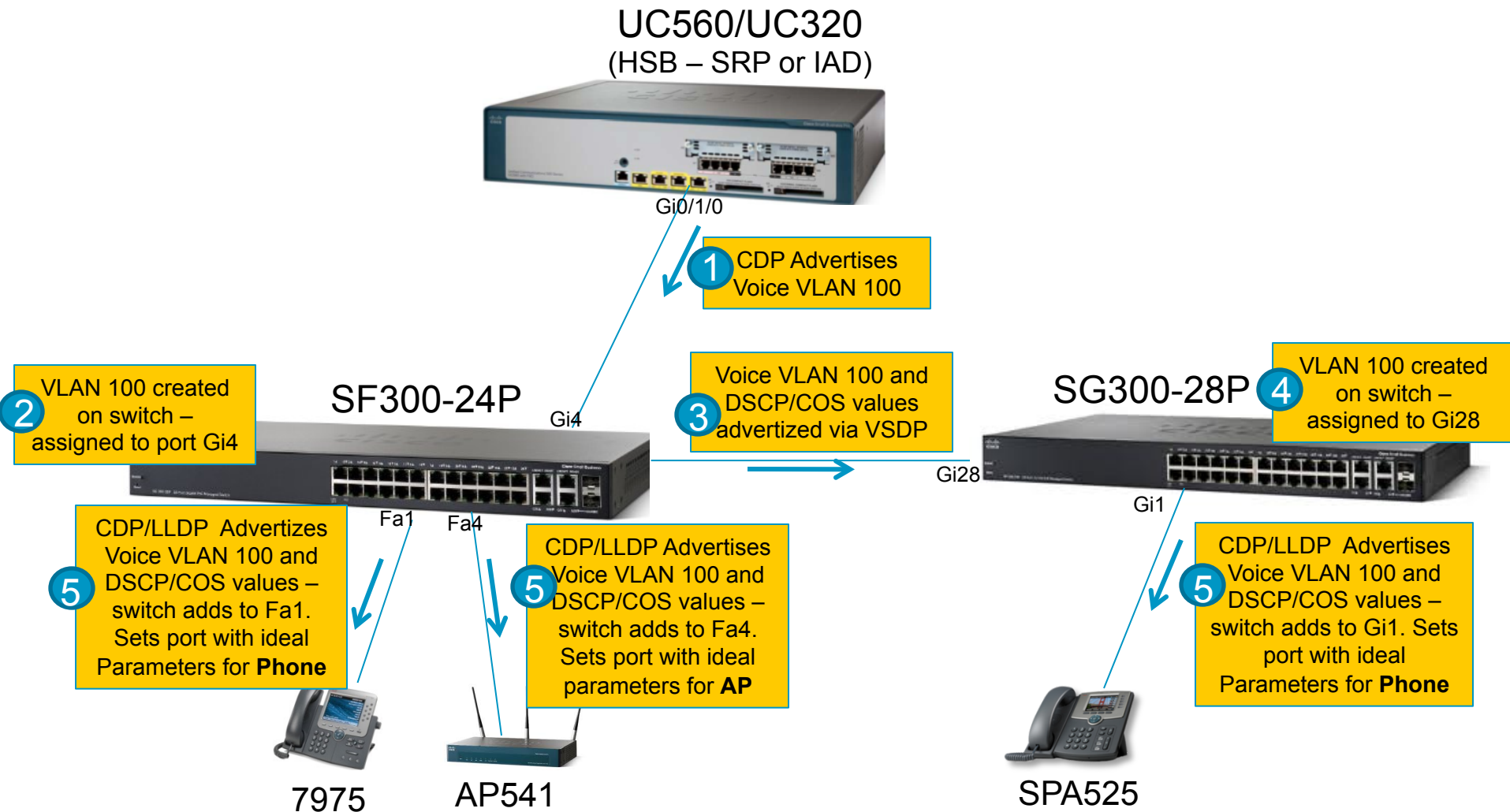
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Legend

Manual Config

Automatic setup

Operational flow



Sx500/300/200 in UC deployments

- Power the phones using PoE

- Zero-touch deployments

Learns the Voice VLAN from UC3xx/5xx or IAD via CDP/LLDP

Propagate the learnt Voice VLAN information through the network using VSDP

Instruct phones via CDP/LLDP on Voice VLAN and QoS parameters to use

Automatically assign Voice VLAN on all relevant ports in the network

- Links between Switches
- Links to UC and IAD
- Links to Phones
- Links to APs

Automatically set Security levels for different types of devices with Auto Smartports

Number of devices, Storm Control, Port mode, VLAN, Spanning Tree

Voice Service Discovery Protocol (VSDP)

- VSDP is a protocol that allows switches to exchange and agree on Voice VLAN information across the network.
- The properties agreed about via VSDP are:
 - Voice VLAN_ID
 - VPT
 - DSCP
- VSDP information are encapsulated in UDP mDNS packets.

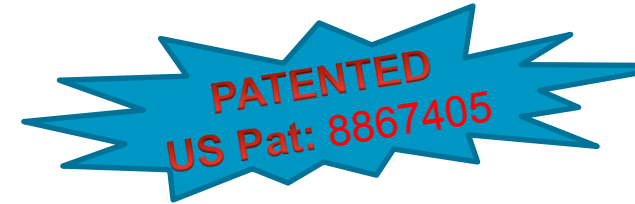
Network-wide Zero-Touch Voice Deployment

- Zero-Touch Voice

 - Automatically configures switch correctly

 - Instructs Voice VLAN and QoS to use

 - Use a combination of CDP, LLDP-MED, VSDP (Voice Services Discovery Protocol), Auto Smartports, and mDNS



- Unique network-wide auto config

 - Endpoints, APs, UC, desktops/servers, network of switches

 - Competitors (HP, H3C, Netgear, D-Link, Avaya, Nortel, Extreme) only support auto config for voice endpoints (network edge only)

- Dynamically adjusts for changes

 - Voice VLAN

 - QoS

 - Multiple Call Control sources in the network

 - Any mis-configurations around Voice VLAN or QoS

- Supported on Cisco 200, 300, and 500 series switches



Objections

- “Why are product defaults not just good enough?”

Defaults don't account for:

- Connecting different types of endpoints/infrastructure – Phones, APs, etc
- Networks using different settings – Voice VLAN, QoS, etc

Does not address:

- Network changes around Voice VLAN or QoS
- Having multiple call control sources in the network
- Mis-configurations

- “Why can't I just use GVRP/GARP to propagate voice VLAN?”

GVRP/GARP only addresses VLAN propagation. QoS policy is not propagated. Also Voice VLAN information is not known

Does not account for:

One switch using different voice VLAN than another

Network changes around Voice VLAN or QoS

Having multiple call control sources in the network

Mis-configurations

OUI Voice VLAN

- OUI Voice VLAN allows device to identify phones based on phone OUI
- OUI Voice VLAN operation:
 - Uses a dedicated VLAN for VoIP traffic.
 - Assigns “enabled” ports to Voice VLAN based on phone SMAC received on a port
 - Applies appropriate QoS policy on these port(s).
- The following still needs to be configured:
 - (the same) Voice VLAN on all switches
 - Ports to be “Voice VLAN enabled”
 - Phone OUI
- OUI Voice VLAN does not provide a method to advertise and dynamically set Voice VLAN ID across the network

Auto Voice VLAN

- Auto Voice VLAN addresses VoIP challenges by:
 - Allowing switches on the network to exchange Voice VLAN information to determine single “Voice configuration” across the network.
 - Synchronize all end points (IP phones) with desired VoIP parameters.
 - Automatically configure ports connected to IP phones with required settings
 - Automatically configures the trunk ports as members of the Voice VLAN

Auto Voice VLAN Operational Flow

- The Operational flow of Auto Voice VLAN consist of the following:
 - Synchronizing Voice VLAN Parameters across the network
 - Applying the synchronized parameters
 - IP Phone operation
- Synchronizing Voice VLAN parameters across the network includes:
 - Determining the Local Best Voice VLAN on each switch
 - Agreeing on the same Voice VLAN parameters between all switches.
- Applying the synchronized parameters is used to:
 - Configure the appropriate SmartPort type to ports
 - Advertise Voice VLAN Parameters via CDP/LLDP to allow proper phone operation

Plug & Play Configuration



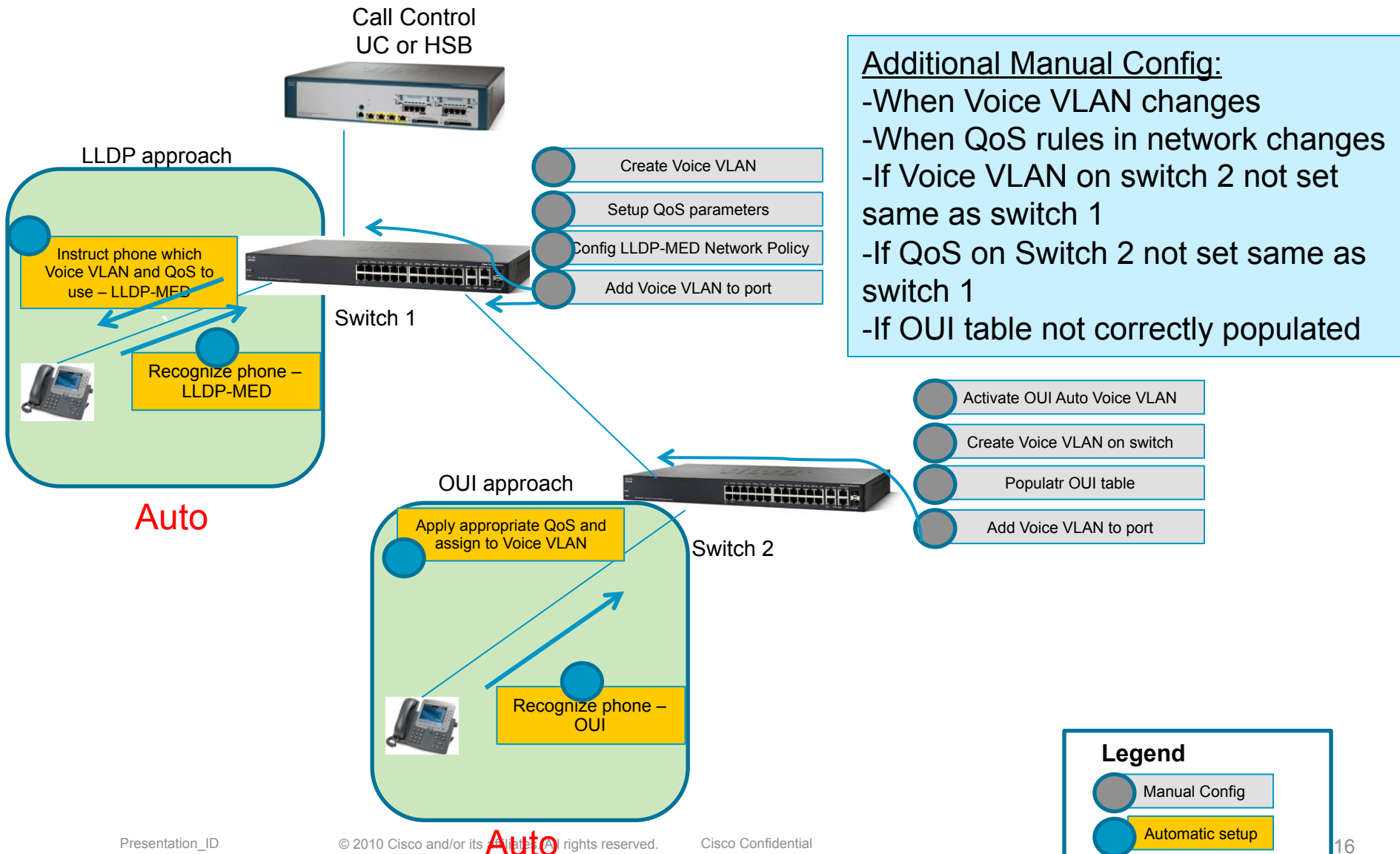
Automatic Port Provisioning Based On Device Intelligence

- Upon endpoint connection, access switch gathers device intelligence via CDP, LLDP, MAC OUI etc
- Automatic port configuration of pre-defined macro based on device ID
- Built-in system macros and customizable
- Cisco Digital Media Players , IP Surveillance Cameras , IP phones , Access points

Benefits:

- Lower TCO with plug-and-play provisioning

Auto Voice VLAN Competitor support



Tolly Independent Validation

- 3rd party Tolly Group report/analysis
- Test compares
 - Cisco 300 Series switches
 - HP Networking E-Series
 - NETGEAR
 - D-Link
- 300 Series switches win all categories
- For full report:

www.cisco.com/go/300switchestolly

The Bottom Line

The Cisco 300 Series 10/100 and GbE Managed Switches delivered:

- 1 Wire-speed, non-blocking, Layer 2 throughput at all frame sizes tested from 64 to 1518 bytes
- 2 Consistently low latency at all frame sizes
- 3 **Best Price/Performance** among switches tested
- 4 Most extensive feature set: IPv6, traffic shaping and rate limiting, scope of GUI-based configuration
- 5 **Lowest power consumption** in 2 of the 3 classes tested, and best-in-class power efficiency overall
- 6 Most extensive set of IPv6 protocol and application support
- 7 **Best usability** with a simplified user interface delivering both basic and advanced capabilities in an intuitive fashion

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Miercom Stackable Lab Report – DR120911



"We were impressed with the comprehensive set of features, performance, overall power efficiency, and ease-of-use of the Cisco switches... best resiliency when subjected to a DoS attack...more economical ... most efficient...easiest to configure and implement, forwarded line rate full mesh traffic at all frame sizes with zero packet loss, and provided the most extensive support for IPv6 transitions." - Rob Smithers, CEO Miercom

Stacking features	Cisco 500X	HP 2910a1
Stack Type	Ring/ Chain	Cluster
Stack units function as a single switch	✓	✗
Stack resilience – Backup Master/Commander	✓	✗
Lowest switch failover/ recovery impact	✓	✗
Automatic stack formation	✓	✗
Stack LEDs	✓	✗
Cross-stack sync – ACL, MAC, VLAN tables	✓	✗
Cross-stack functions – LAG and PortMirroring	✓	✗

General capabilities	Cisco 500X	HP 2910a1
Lowest Energy consumption	✓	✗
Energy Efficient Ethernet (EEE)	✓	✗
Operation under attack	Pass	Fail
Best ease-of-use	✓	✗
Lowest cost per Gig	✓	✗
Lowest price - POE watt	✓	✗
Highest capacity (VLANs, ACLs, MAC)	✓	✗

Download report at:
www.miercom.com



Cisco 300 Series Switching Competitive Comparison

	Cisco 300 Managed	Netgear Managed <i>FSM/GSM</i>	D-Link Managed <i>DES/DGS</i>	HP Managed <i>E2810, E2620, E2510, E2520</i>	<i>Adtran Netvanta 1200 ,1500</i>
Advanced Features – IPv6, L3, etc	★ ★ ★	★	★	★	★
Cisco Unique Value + Price competitiveness	CDP, CCA, Smartports	✗	✗	✗	✗
Programs: FastTrack, PDF, etc	★ ★ ★	✗	✗	✗	✗
Warranty + Support	★ ★ ★	★	★	★ ★	★ ★
Multiple Mgmt: LLDP/CDP/Bonjour CLI/Menu CLI SNMP Management FindIT	★ ★ ★	★ ★	★ ★	★ ★	★ ★