Cisco Support Community Expert Series Webcast:

Simplifying Enterprise QoS with Media Awareness

Eric Yu
Customer Support Engineer

August 21, 2012

Cisco Support Community – Expert Series Webcast

- Today's featured expert is Cisco Support Engineer **Eric Yu**
- Ask him questions now about Medianet.

Eric Yu

- Supports video performance
- 10 years of experience
- CCIE in Routing and Switching

Thank You for Joining Us Today

Today's presentation will include audience polling questions

We encourage you to participate!

Thank You for Joining Us Today

If you would like a copy of the presentation slides, click the PDF link in the chat box on the right or go to

https://supportforums.cisco.com/docs/DOC-26577

Polling Question 1

What is your role with supporting the network for voice and video?

a) System Engineering

b) Network Operations

c) Voice and video Engineering

d) End user voice or video

Submit Your Questions Now!

Use the Q&A panel to submit your questions. Experts will start responding those

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Simplifying Enterprise QoS with Media Awareness

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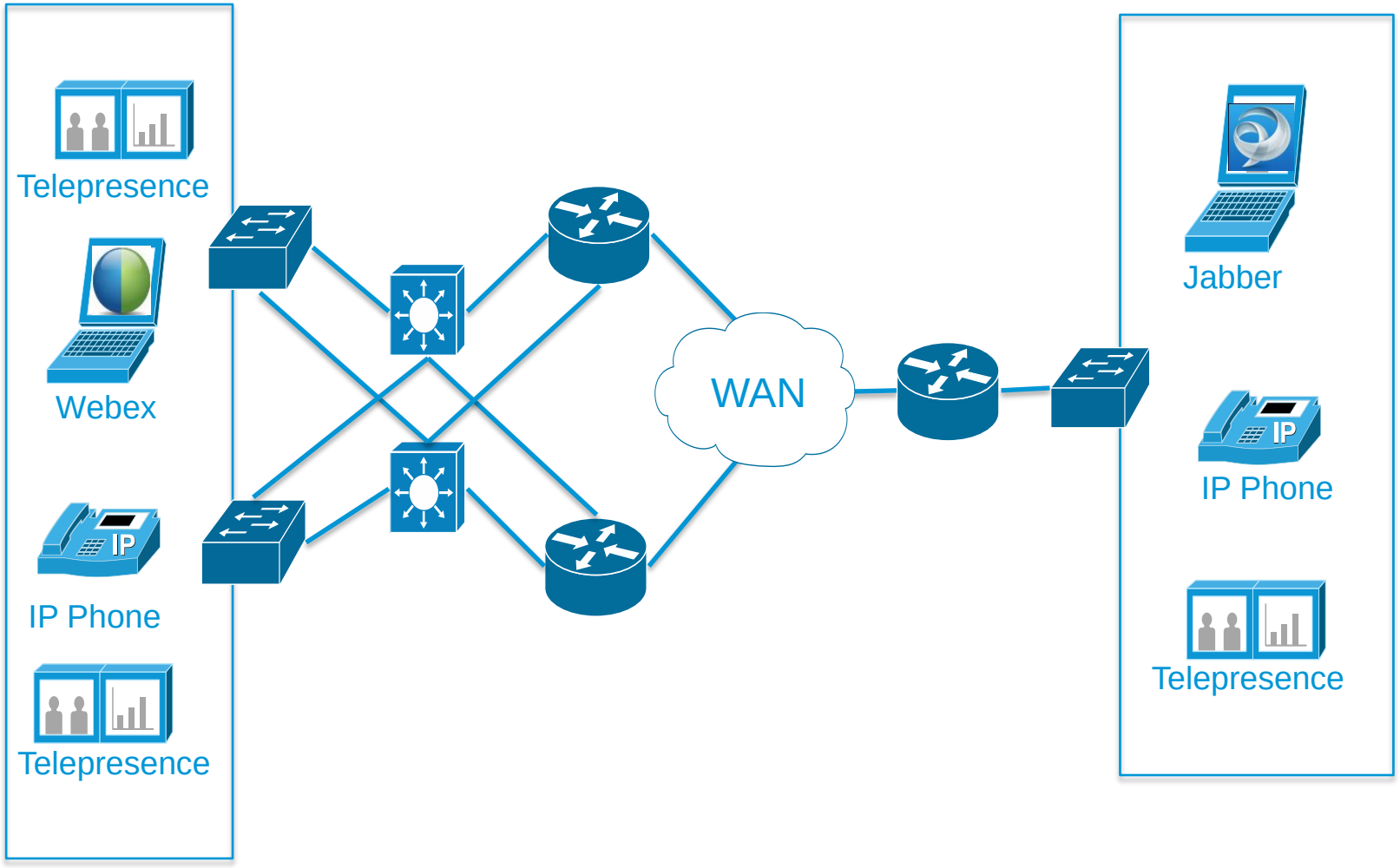
Agenda

- **Cisco Medianet Overview**
- **Understanding Medianet Media Awareness**
- **Media Awareness Integration**

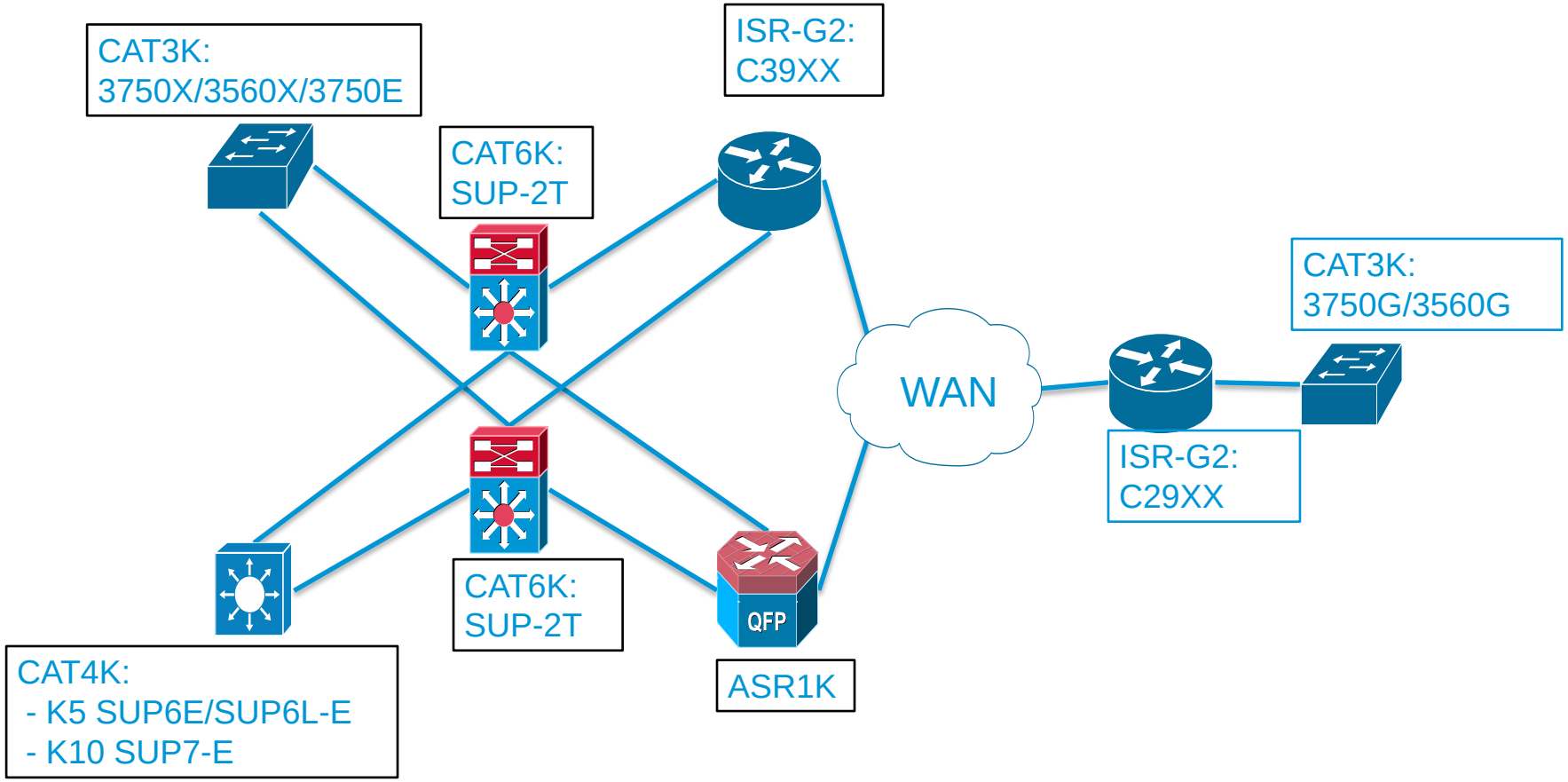
Logical Reference Topology



Reference

Medianet Hardware Topology Reference

Required Hardware for Medianet

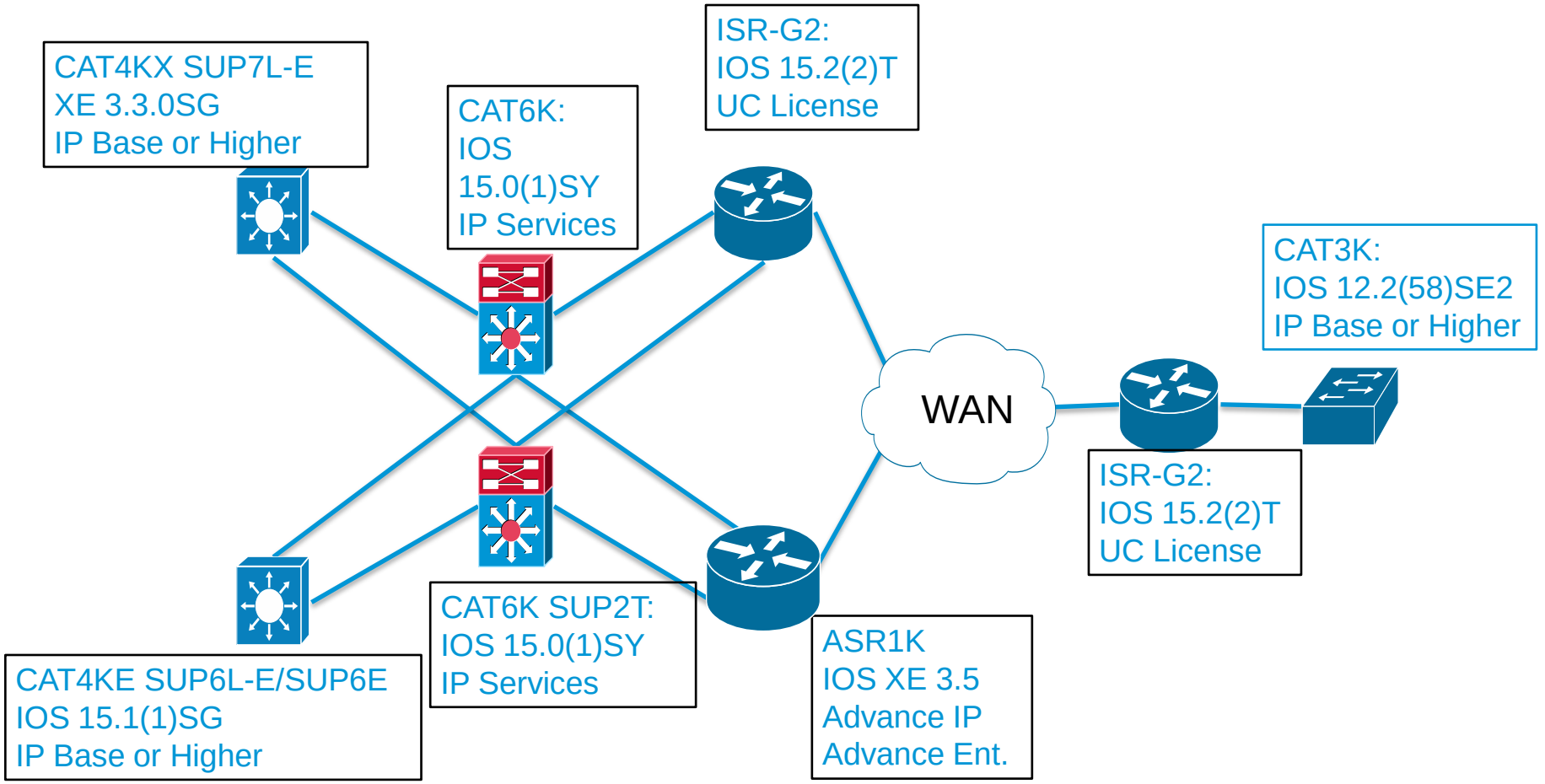


Reference: http://www.cisco.com/en/US/prod/collateral/routers/ps10536/data_sheet_c78-612429.html

Medianet Software Reference

Reference

Required Software and License Feature for **Medianet Video Monitoring**



Reference: http://www.cisco.com/en/US/prod/collateral/routers/ps10536/data_sheet_c78-612429.html

Agenda

- **Cisco Medianet Overview**
- **Understanding Medianet Media Awareness**
- **Media Awareness Integration**

What is Medianet? Layered Approach

Features

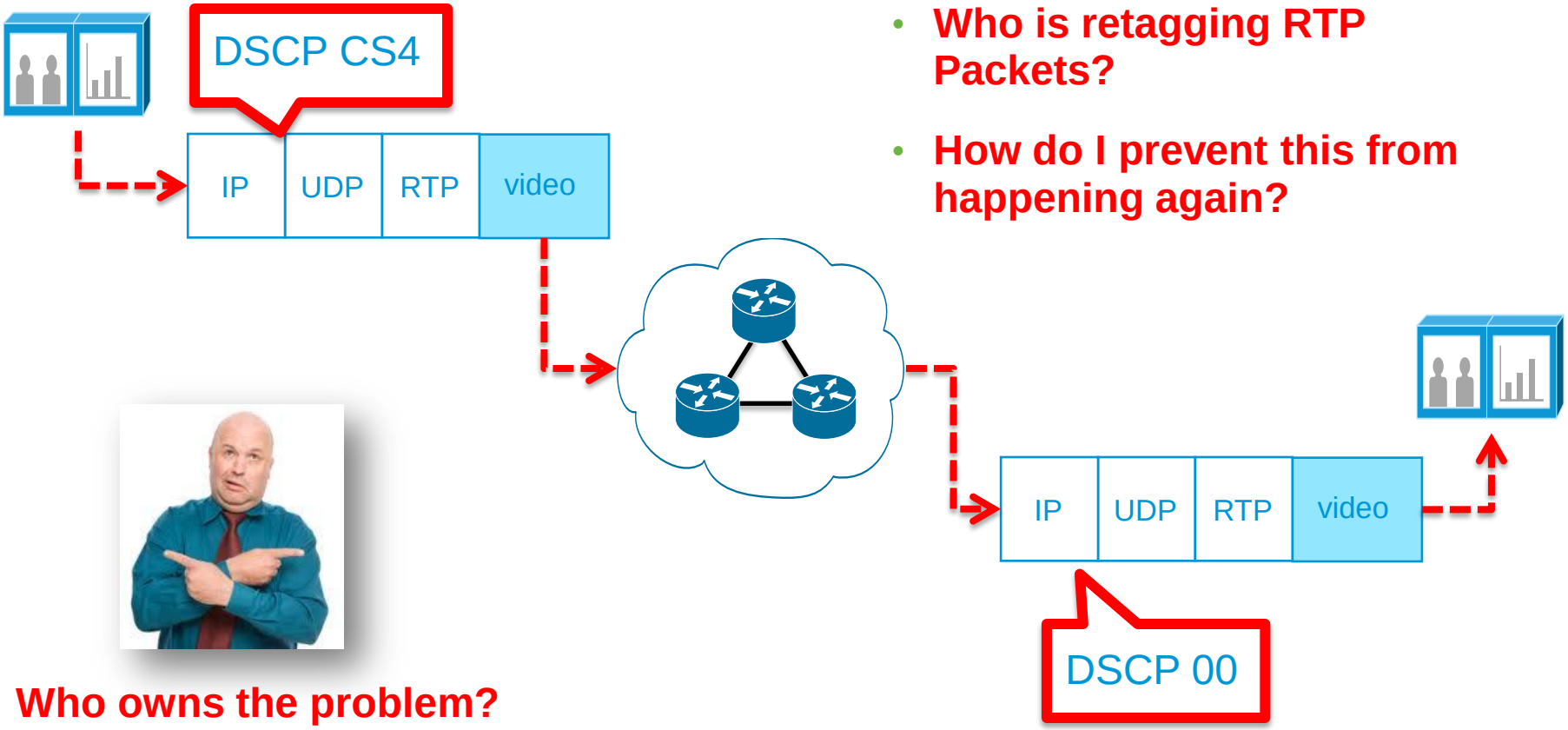
Traffic Simulation	*Model impact of video traffic on the network*
Metadata	*Identify traffic class for network services*
Video Monitoring	*Monitor network stats for Media streams (TCP/RTP)*
Mediatrace	*Invoke end-to end, hop-by-hop diagnostics*
Auto Smart Ports	*Self Configuring Access Switch Ports*

Converged Multi-Service IP Network

Preserving Quality of Experience

Ensuring End to End QoS

- **Are all user's quality of experience impacted?**
- **Who is retagging RTP Packets?**
- **How do I prevent this from happening again?**



Who owns the problem?

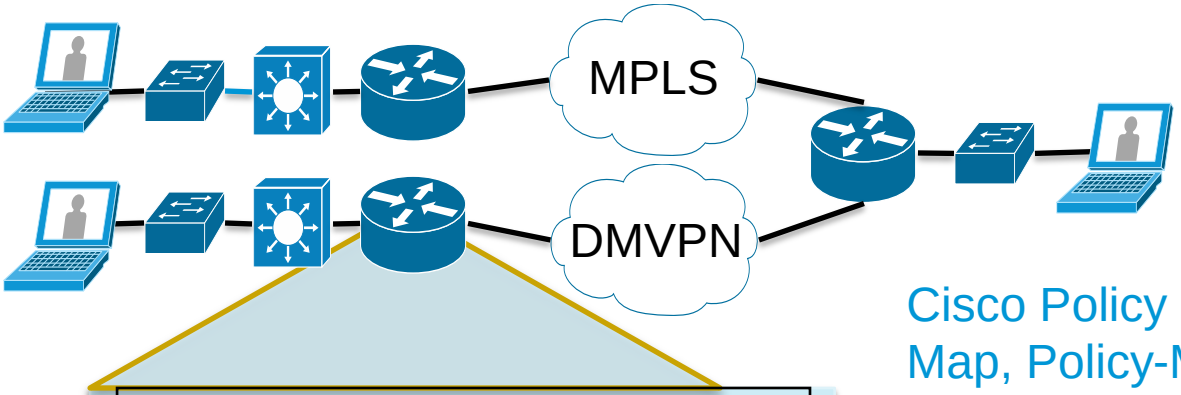
Cisco Medianet DiffServ QoS Recommendations (RFC 4594-Based)

Application Examples	Application Class	Per-Hop Behavior	Queuing & Dropping
Cisco IP Phones (G.711, G.729)	VoIP Telephony	EF	Priority Queue (PQ)
Cisco IP Video Surveillance / Cisco Enterprise TV	Broadcast Video	CS5	(Optional) PQ
Cisco TelePresence	Realtime Interactive	CS4	(Optional) PQ
Cisco Unified Personal Communicator, WebEx	Multimedia Conferencing	AF4	BW Queue + DSCP WRED
Cisco Digital Media System (VoDs)	Multimedia Streaming	AF3	BW Queue + DSCP WRED
EIGRP, OSPF, BGP, HSRP, IKE	Network Control	CS6	BW Queue
SCCP, SIP, H.323	Call-Signaling	CS3	BW Queue
SNMP, SSH, Syslog	Ops / Admin / Mgmt (OAM)	CS2	BW Queue
ERP Apps, CRM Apps, Database Apps	Transactional Data	AF2	BW Queue + DSCP WRED
E-mail, FTP, Backup Apps, Content Distribution	Bulk Data	AF1	BW Queue + DSCP WRED
Default Class	Best Effort	DF	Default Queue + RED
YouTube, iTunes, BitTorent, Xbox Live	Scavenger	CS1	Min BW Queue (Deferential)

http://www.cisco.com/en/US/docs/solutions/Enterprise/WAN_and_MAN/QoS_SRND_40/QoSIntro_40.html#wp61104

CPL Configuration Example

Configuration



Cisco Policy Language = Class-Map, Policy-Map Configuration Methodology

```
class-map match-all RTP-voice
   match  dscp ef
class-map match-any RTP-Video
  match  dscp cs4  af31
!
```

Classify traffic based on DSCP, ACL, NBAR

```
policy-map MediaPriority
  class RTP-voice
     priority 512
  class RTP-Video
     bandwidth percent 13
  class class-default
     fair-queue
!
```

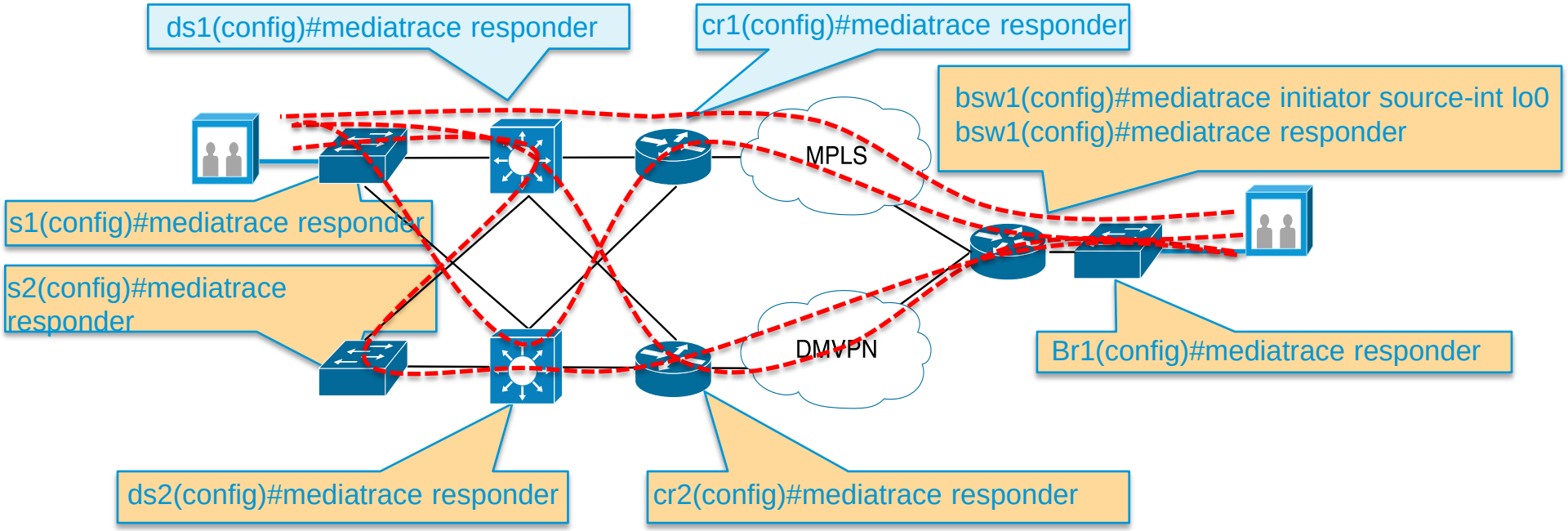
Define QoS policy & allocating bandwidth per traffic class

```
interface GigabitEthernet0/0
  ip address 14.50.99.19 255.255.255.240
  service-policy output MediaPriority
```

Apply QoS policy to an interface (inbound or out)

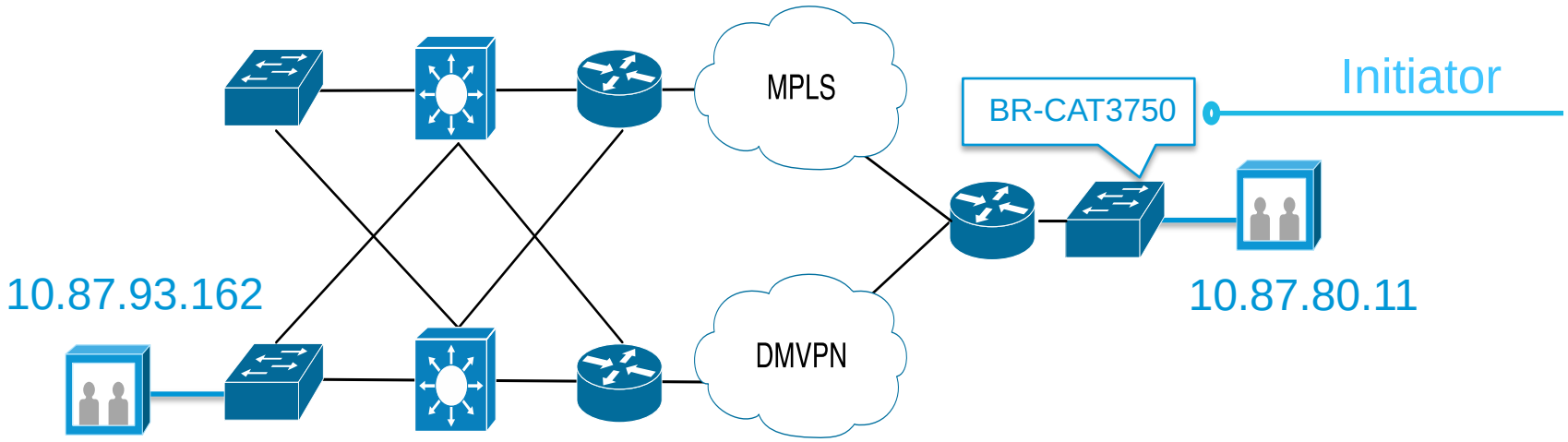
Configuration

Pervasive Mediatrace Responder



- Regardless of Media Path, responder reports metrics when inquired

Mediatrace RTP Performance Along Path



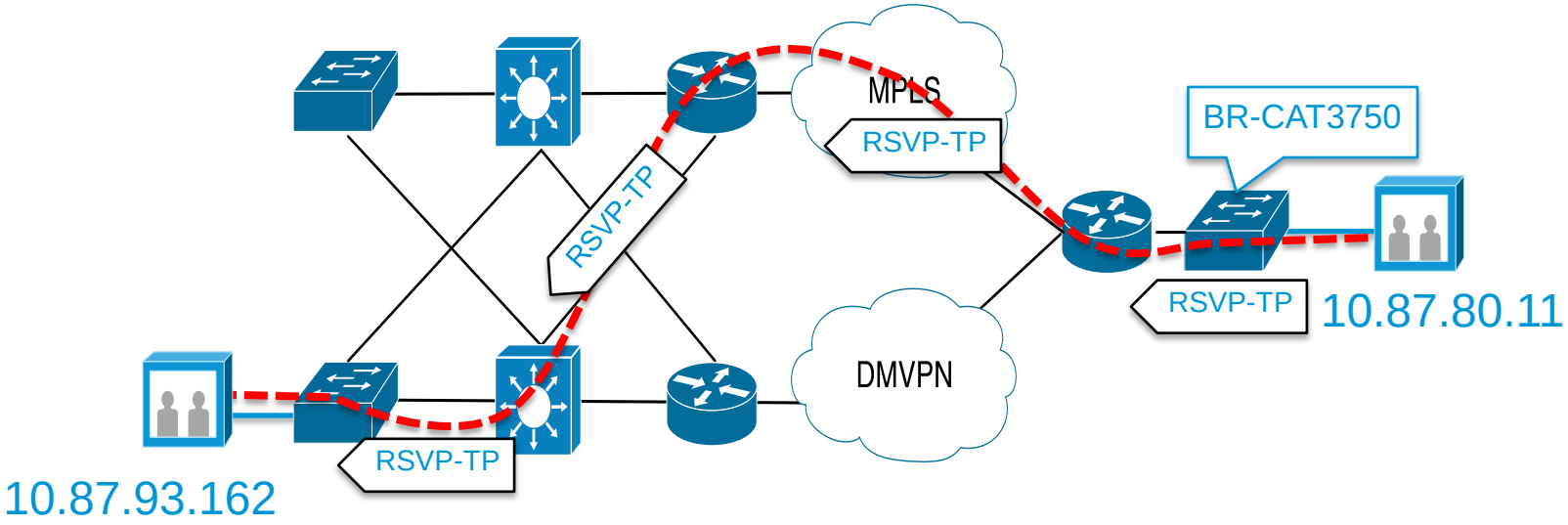
BR-CAT3750#mediatrace poll path source 10.87.93.162 destination 10.87.80.11 perf-mon

Started the data fetch operation.
Waiting for data from hops.
This may take several seconds to complete...
Data received for hop 0
Data received for hop 1
Data received for hop 2
Data fetch complete.

Mediatrace
CAT3750
IOS
12.2(58)SE2

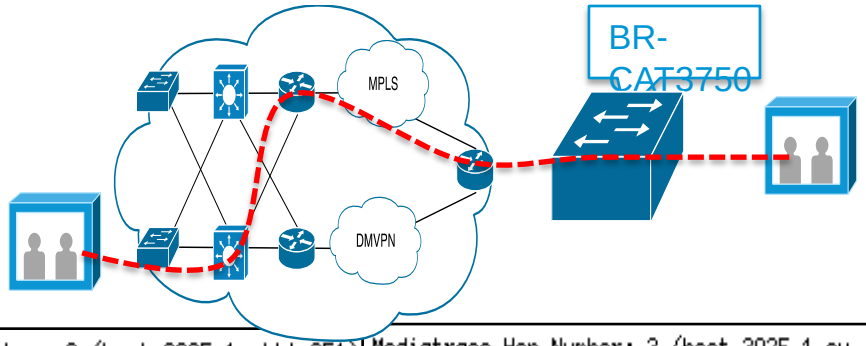
Options
app-health
configless
hops
l2-params
perf-monitor
system

Mediatrace: RSVP Messages as a Transport



- Exclusive RSVP Configuration NOT required (transport only)
- RSVP messages routed on same path as media packets
- RSVP message transports collected media monitoring statistics

Mediatrace Console Output




```
Mediatrace Hop Number: 1 (host=3925-3, ttl=254)
  Metrics Collection Status: Success
  Reachability Address: 10.87.93.250
  Ingress Interface: Gi1/0
  Egress Interface: Gi0/2
  Metrics Collected:
    Flow Sampling Start Timestamp: 10:17:30
    Loss of measurement confidence: FALSE
    Media Stop Event Occurred: FALSE
    IP Packet Drop Count (pkts): 0
    IP Byte Count (KB): 16261.461
    IP Packet Count (pkts): 14489
    IP Byte Rate (Bps): 542048
    Packet Drop Reason: 64
```

IP DSCP: 0x20

```
    Media Byte Rate Average (Bps): 532389
    Media Byte Count (KB): 15971.681
RTP Interarrival Jitter Average (usec): 23
RTP Packets Lost (pkts): 0
RTP Packets Expected (pkts): 14507
RTP Packet Lost Event Count: 0
RTP Loss Percent (%): 0.00
```

```
Mediatrace Hop Number: 2 (host=3925-1, ttl=251)
  Metrics Collection Status: Success
  Reachability Address: 10.87.93.45
  Ingress Interface: Gi0/0
  Egress Interface: Gi1/0
  Metrics Collected:
    Flow Sampling Start Timestamp: 10:17:30
    Loss of measurement confidence: FALSE
    Media Stop Event Occurred: FALSE
    IP Packet Drop Count (pkts): 0
    IP Byte Count (KB): 16281.158
    IP Packet Count (pkts): 14507
    IP Byte Rate (Bps): 542705
    Packet Drop Reason: 64
```

IP DSCP: 0x00

```
    Media Byte Rate Average (Bps): 1330
    Media Byte Count (KB): 15991.018
    Media Packet Count (pkts): 14507
    RTP Interarrival Jitter Average (usec): 23
    RTP Packets Lost (pkts): 0
    RTP Packets Expected (pkts): 14507
    RTP Packet Lost Event Count: 0
    RTP Loss Percent (%): 0.00
```

```
Mediatrace Hop Number: 3 (host=3925-1-sw, ttl=250)
  Metrics Collection Status: Success
  Reachability Address: 192.168.66.2
  Ingress Interface: Gi0/18
  Egress Interface: NOT COLLECTED
  Metrics Collected:
    Flow Sampling Start Timestamp: 10:17:40
    Loss of measurement confidence: FALSE
    Media Stop Event Occurred: FALSE
    IP Packet Drop Count (pkts): 0
    IP Byte Count (KB): 16259.4
    IP Packet Count (pkts): 14489
    IP Byte Rate (Bps): 542048
```

IP DSCP: 0x20

```
    Media Byte Rate Average (Bps): 533033
    Media Byte Count (KB): 15991.018
    Media Packet Count (pkts): 14507
    RTP Interarrival Jitter Average (usec): 23
    RTP Packets Lost (pkts): 0
    RTP Packets Expected (pkts): 14507
    RTP Packet Lost Event Count: 0
    RTP Loss Percent (%): 0.00
```

Mediatrace GUI Output

Cisco Prime Collaboration Manager

Troubleshooting

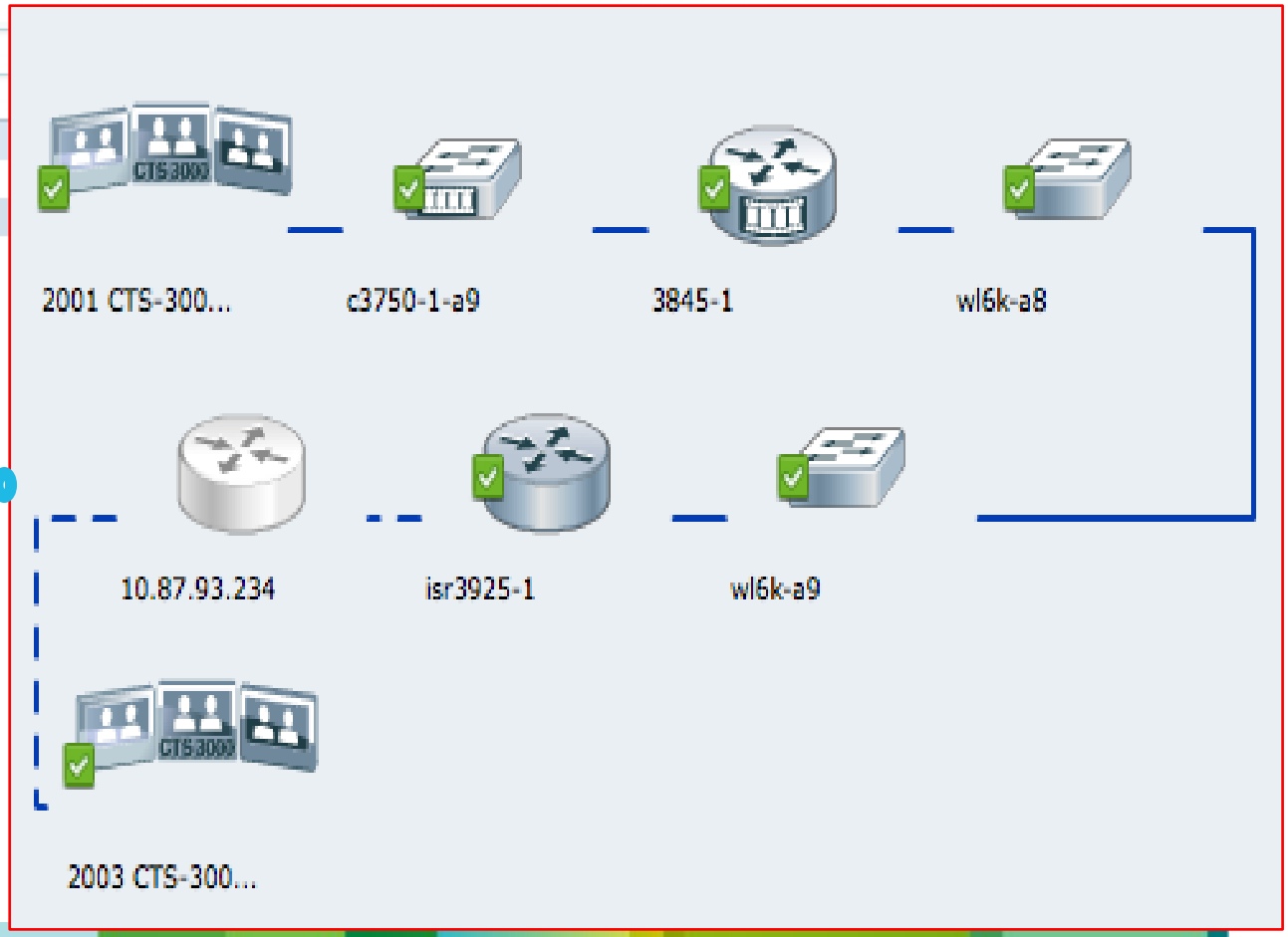
Session Information

Subject **2003 CTS-3000 Site3 - ...**
Structure **Point-to-Point Session**
Session Type **Ad hoc**
Status **In Progress**
Scheduler **N/A**
Elapsed Time **00:39:13**
Start Time **2012-Mar-30 18:31:07 EDT**

View Session Topology

Troubleshooting Status

	From	To	Status	Action
○	2003 CTS-3000...	2001 CTS-3000...	No CLI access	
◉	2001 CTS-3000...	2003 CTS-3000...	In Progress	Stop



Mediatrace Results on CPCM

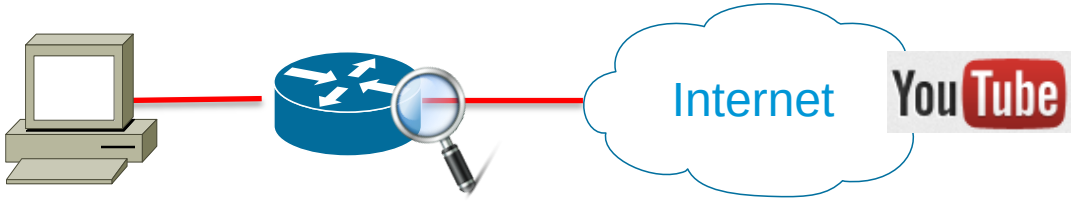
CPCM invoked trace on initiator thru WSMA (web services management agent

Performance Monitor Capabilities

Precise Traffic Flow Discovery and Analysis

- Network device discovers traffic flow for performance analysis
- System operator defines metrics to gauge performance
- Per-Device Hop metric collection for RTP and TCP traffic;
  - RTP performance metrics; (Pkt-Rate, Jitter, Loss)
  - TCP performance metrics; (Media Pkt-Rate, Round-Trip-Time)
- Proactive monitoring for voice and video quality of service

Performance Monitor Limited Visibility

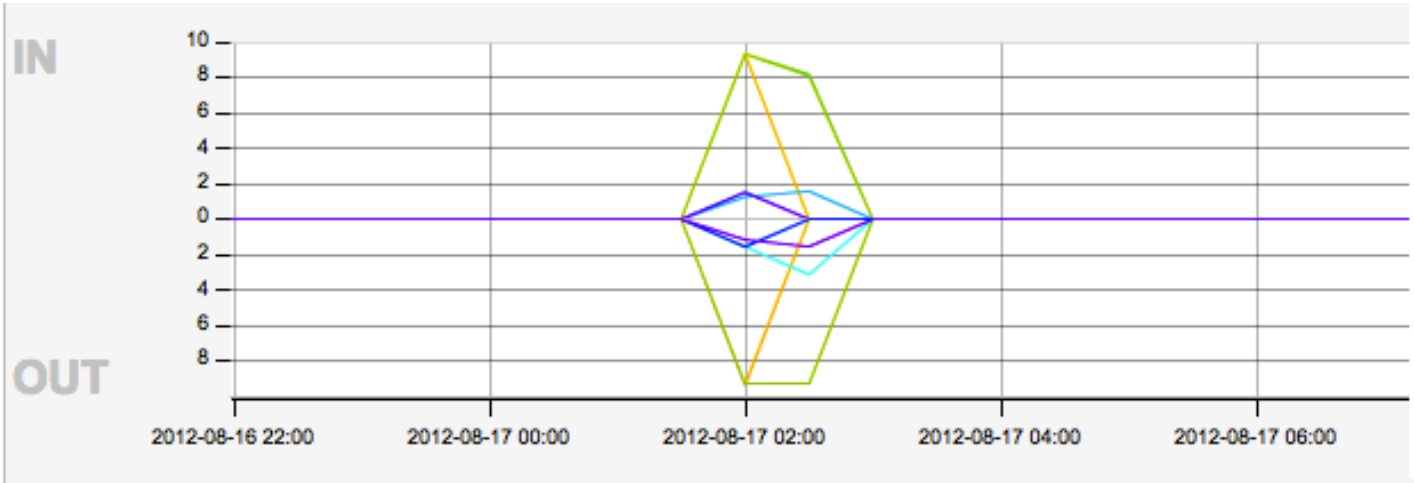



```
HQR1#show performance monitor status
Match: ipv4 source address = 10.87.80.138, ipv4 destination address = 74.125.228.39, transport
source-port = 49937, transport destination-port = 80, ip protocol = 6,
 Policy: tcp-metric, Class: tcp

 routing forwarding-status                    : Unknow
 transport round-trip-time          (msec)  : NA
 transport round-trip-time sum      (msec)  : NA
 transport round-trip-time samples           : NA
 transport event packet-loss counter         : 1
 interface input                             : Null
 interface output                            : Null
 counter bytes                               : 240
 counter packets                             : 3
 counter bytes rate                          : 4
 application media bytes counter             : 120
 application media packets counter long      : 3
 application media packets rate              : 0
 application media event                     : Stop
 monitor event                               : false
 transport round-trip-time min      (msec)  : NA
 transport round-trip-time max      (msec)  : NA
 ip dscp                                     : 0x00
 ip ttl                                      : 0
```

```
HQR1
!
ip access-list extended http
 permit tcp any any eq www
!
class-map match-all http
  match access-group name http
!
policy-map type performance-monitor tcp-metric
 class tcp
   flow monitor inline
    record default-tcp

interface GigabitEthernet0/2
 service-policy type performance-monitor input tcp-metric
 service-policy type performance-monitor output tcp-metric
```

Performance Monitor on GUI

Scrutinizer™ NetFlow & sFlow Analyzer



Last 24 Hours | 2012-8-16 21:30 | to | 2012-8-17 21:30 | Apply Dates | View Raw Flows (Inbound , Outbound)

[1.00 Gb/s] Results 1 - 10 of 13 (0.02s)

Metering: Ingress

	Source	DSCP	Destination	SSRC	% Pkt Loss	TEPL	Jitter
1	10.87.93.162	DSCP 32(CS4)	10.87.93.152	1792112573	0.00 %	0.00 p	**9.33 ms**
2	10.87.93.162	DSCP 32(CS4)	10.87.93.152	3569073435	0.00 %	0.00 p	**9.33 ms**
3	10.87.93.162	DSCP 32(CS4)	10.87.93.152	3646913297	0.00 %	0.00 p	**9.32 ms**
4	10.87.93.162	DSCP 32(CS4)	10.87.93.152	503055511	0.00 %	0.00 p	**8.39 ms**
5	10.87.93.162	DSCP 32(CS4)	10.87.93.152	1616468325	0.00 %	0.00 p	**8.38 ms**
6	10.87.93.162	DSCP 32(CS4)	10.87.93.152	2522827919	0.00 %	0.00 p	**8.32 ms**
7	10.87.93.162	DSCP 32(CS4)	10.87.93.152	1845323651	0.00 %	0.00 p	**1.56 ms**
8	10.87.93.162	DSCP 32(CS4)	10.87.93.152	2480412055	0.00 %	0.00 p	**1.55 ms**
9	10.87.93.162	DSCP 32(CS4)	10.87.93.152	4281169023	0.00 %	0.00 p	**1.53 ms**
10	10.87.93.162	DSCP 32(CS4)	10.87.93.152	3545416507	0.00 %	0.00 p	**1.52 ms**
Avg	**(from conv tables)**						**3.13 ms**

Prev | 1 | 2 | Next

Polling Question 2

Does your organization have a global Quality of Service Policy?

a) Yes

b) No

c) Work in progress

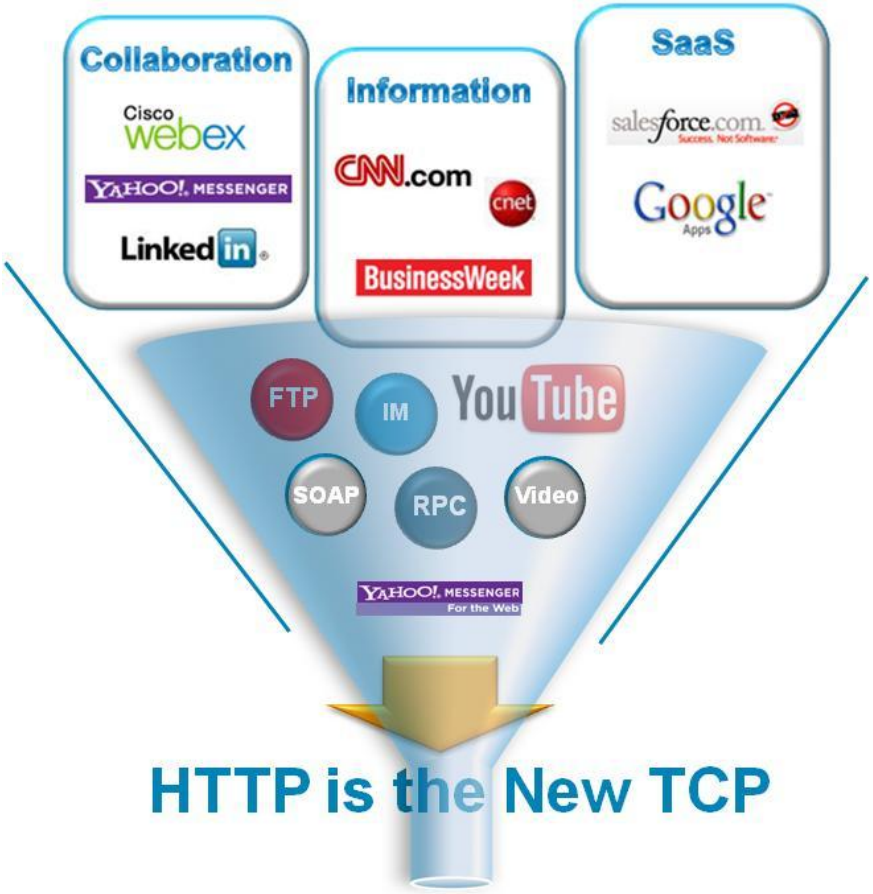
d) I don't know

Agenda

- Cisco Medianet Overview
- Understanding Medianet Media Awareness
  - **NBAR**
  - Metadata Flow
- Media Awareness Integration

HTTP/HTTPS Ports: Open 24x7

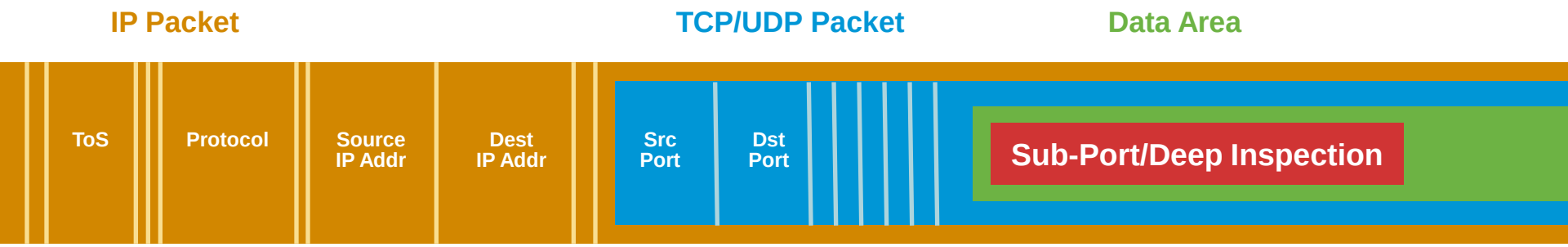
Problem: Static port classification is No Longer Sufficient



- 5 Tuple is a thing of the past, ACL Traffic Class doesn't scale administratively
- Increasing use of Encryption (e.g HTTPS, TLS)
- User Experience sessions are composites of multiple application flows (e.g Webex Video, Voice, Data)
- IPv4 and IPv6 transition techniques proliferation

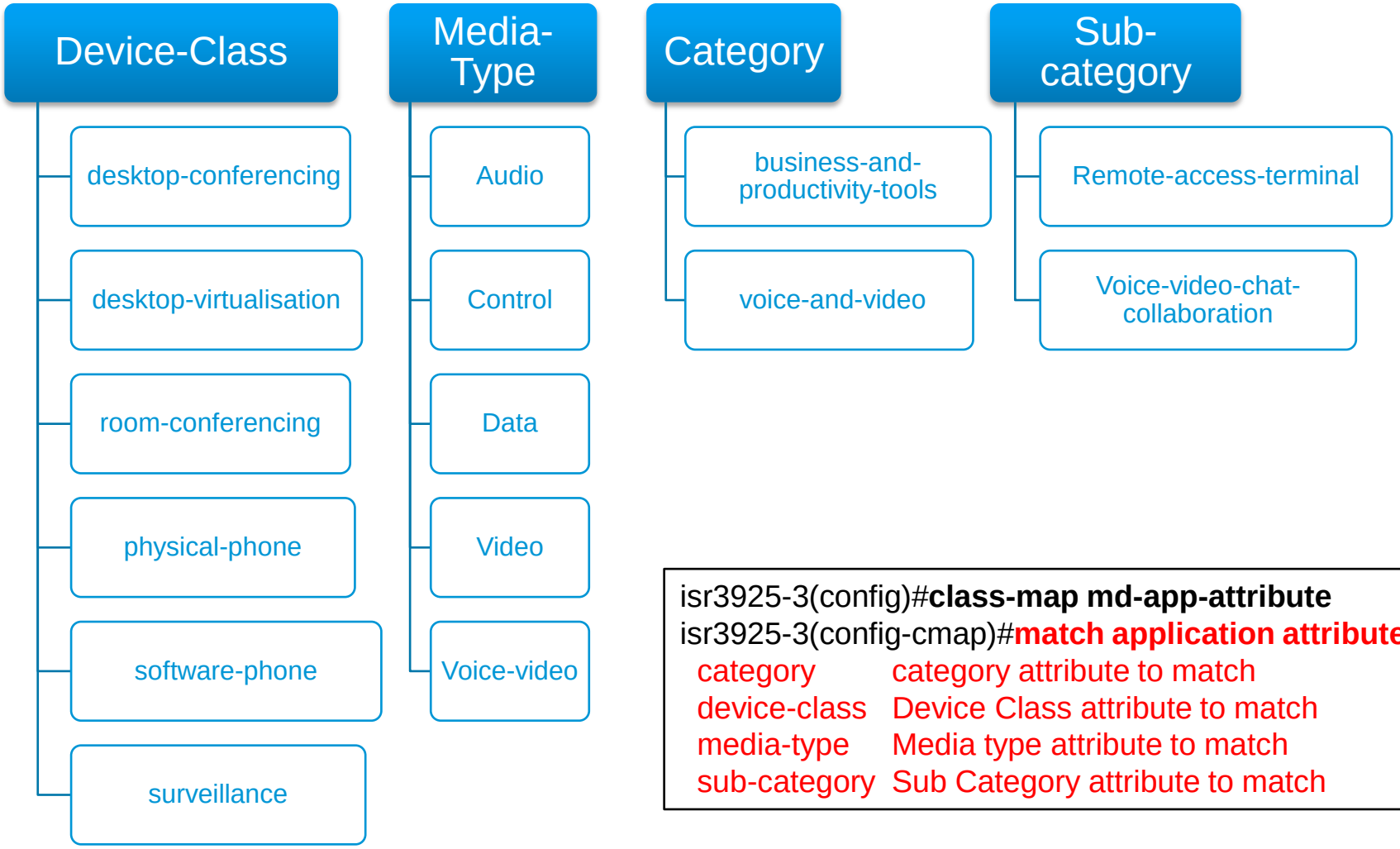
NBAR: Full-Packet Inspection

Stateful and Dynamic Inspection



- Used for intelligent policy (QoS, filtering, etc.) or reporting
- Identifies over 1000 applications and its protocol's TCP/UDP port numbers
  - Statically assigned
  - Dynamically assigned during connection establishment
  - RTP and RTP payload type identification
  - Cisco TelePresence media and signaling supported in IOS 15.1(3)T
  - WebEx desktop-share/audio/video supported in 15.2(2)T
- Non-TCP and non-UDP IP protocols
- Data packet inspection for matching values

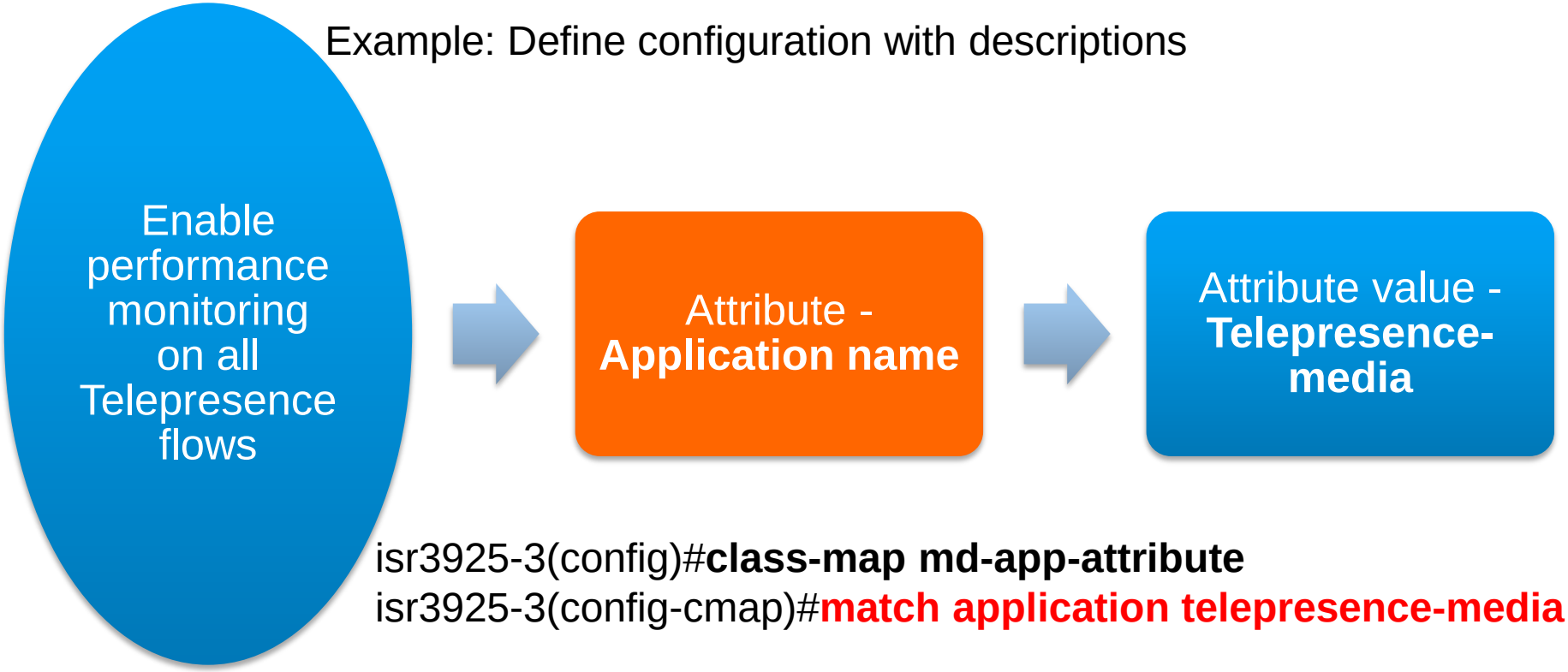
Matching on Application Attributes




```
isr3925-3(config)#class-map md-app-attribute
isr3925-3(config-cmap)#match application attribute ?
  category        category attribute to match
  device-class    Device Class attribute to match
  media-type      Media type attribute to match
  sub-category    Sub Category attribute to match
```

Example: Enable performance-monitoring for all “telepresence” flows

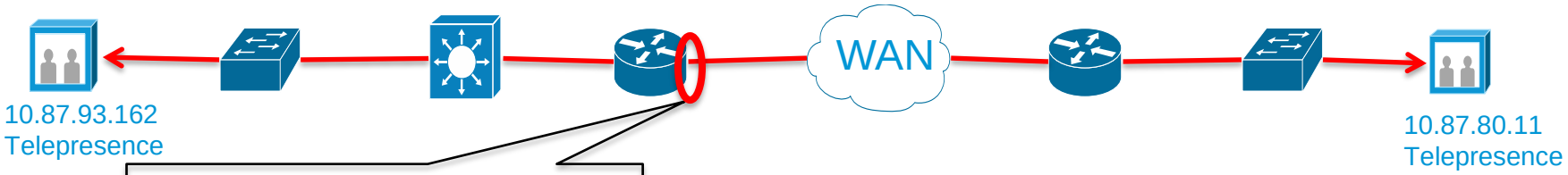
Example: Define configuration with descriptions



isr3925-3(config)#**class-map md-app-attribute**
isr3925-3(config-cmap)#**match application telepresence-media**

Configuration

NBAR and Flexible NetFlow Integration




```
interface gigabitethernet 0/0
 ip nbar protocol-discovery
 ip flow monitor find-app input
 ip flow monitor find-app output
!
flow monitor find-app
 exporter netflow-collector
 record application
!
flow record application
 match ipv4 dscp
 match ipv4 protocol
 match ipv4 source address
 match ipv4 destination address
 match transport source-port
 match transport destination-port
 collect application name
```

NBAR Protocol Discovery

NBAR extracts fields from flows and exposes it into Flexible NetFlow

Netflow Record Collection

Configures NetFlow to collect 5-Tuple information including DSCP value and NBAR Application Name

NBAR and Flexible NetFlow CLI Output

Five-Tuple + DSCP + NBAR AppID = Flexible NetFlow with NBAR

```
isr3925-1#show flow monitor nbar-flow cache
  Cache type:                               Normal
  Cache size:                                 4096
  Current entries:                              25
  High Watermark:                              294

  Flows added:                               12256
  Flows aged:                                12231
    - Active timeout      (  1800 secs)        89
    - Inactive timeout    (    15 secs)      12142
    - Event aged                                0
    - Watermark aged                            0
    - Emergency aged                            0
```

Show command to show IP Flow's 5-Tuple details and the associated DSCP and Application Name

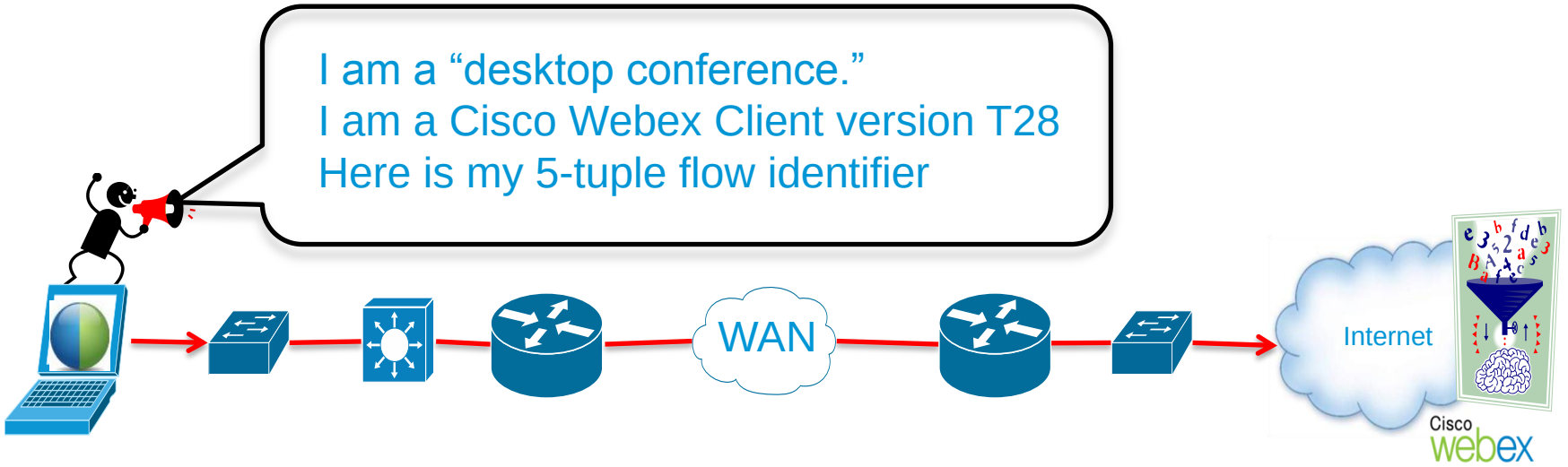
IPV4 SRC ADDR	IPV4 DST ADDR	TRNS SRC PORT	TRNS DST PORT	IP DSCP	IP PROT	APP NAME
10.87.93.162	10.87.80.11	21106	25040	0x20	17	cisco telepresence-media
10.87.93.162	10.87.80.11	21107	25041	0x20	17	cisco telepresence-control
10.87.93.162	10.87.80.11	27346	21296	0x20	17	cisco telepresence-media
10.87.93.162	10.87.80.11	27347	21297	0x20	17	cisco telepresence-control
[illegible]	[illegible]	[illegible]	23	0x00	6	port telnet
10.87.91.134	10.87.80.12	5060	37337	0x00	6	port sip
10.81.254.131	10.87.93.45	123	123	0x00	17	cisco skype

Agenda

- Cisco Medianet Overview
- Understanding Medianet Media Awareness
  - NBAR
  - **Metadata Flow**
- Media Awareness Integration

Metadata Attributes of a Flow

Attribute Announcements to the Network, Not the Payload.



Flow Identifier | **Metadata**

IP Src	IP Dst	Prot	L4 Src	L4 Dst	App Name	App Vendor	App Ver	Endpoint Model	Device Class
10.87.80.130	64.68.106.197	TCP	50402	443	**Webex-meeting**	**Cisco**	**T28**	**Webex-client -data**	**Desktop Conferencing**

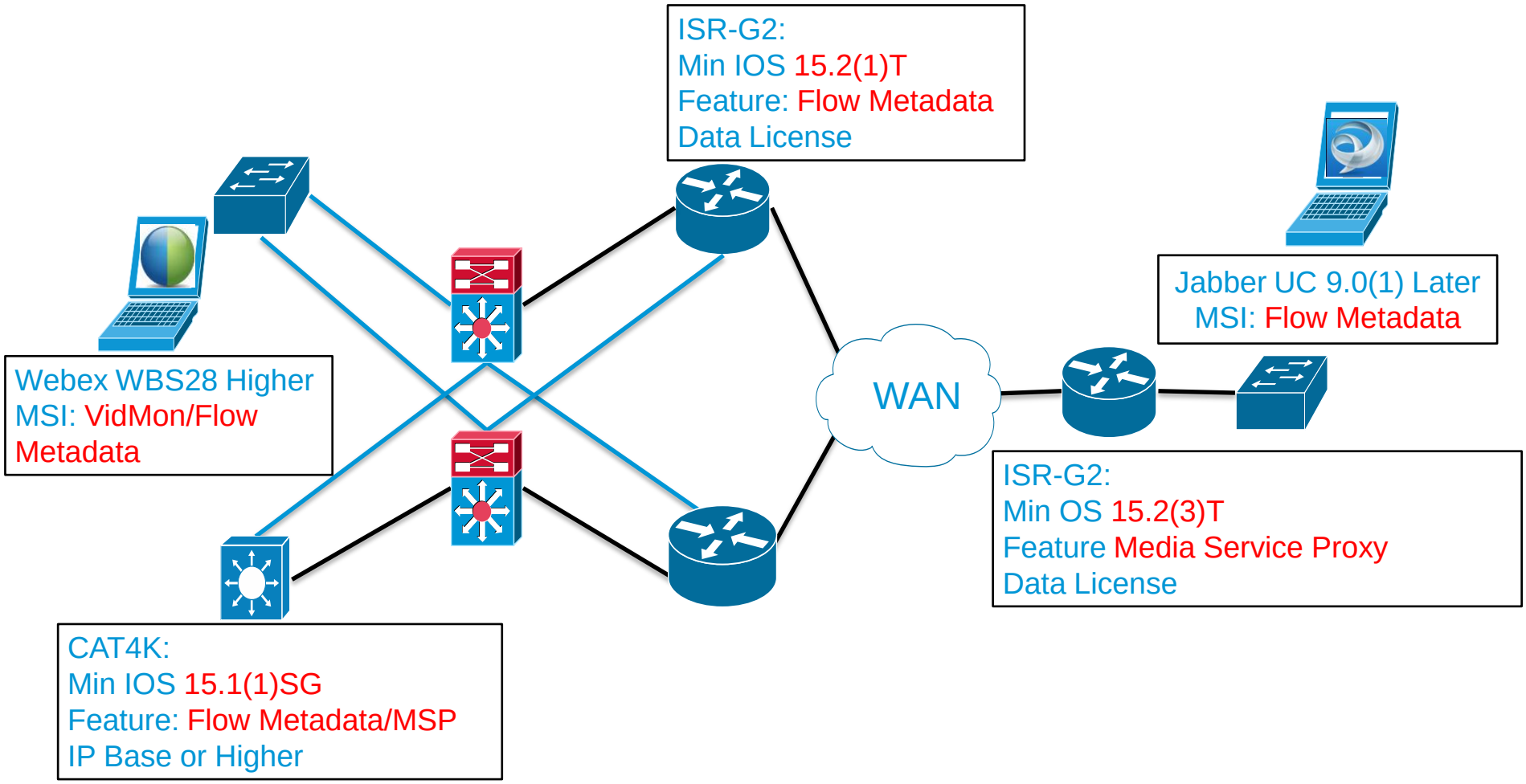
Flow Metadata Components

- **Metadata Producers**
  - Media Service Interface Endpoints
  - NBAR
  - Media Service Proxy Network Devices
- **Flow Metadata Consumers**
  - Cisco Policy Language (QoS/C3PL)
  - Flexible NetFlow
  - Performance Monitor
- **Metadata Flow Database**
- **Metadata Flow Signaling Messages**
  - RSVP Propagates Flow Identifier and Metadata Attributes along IP path.

Medianet Software Reference

Reference

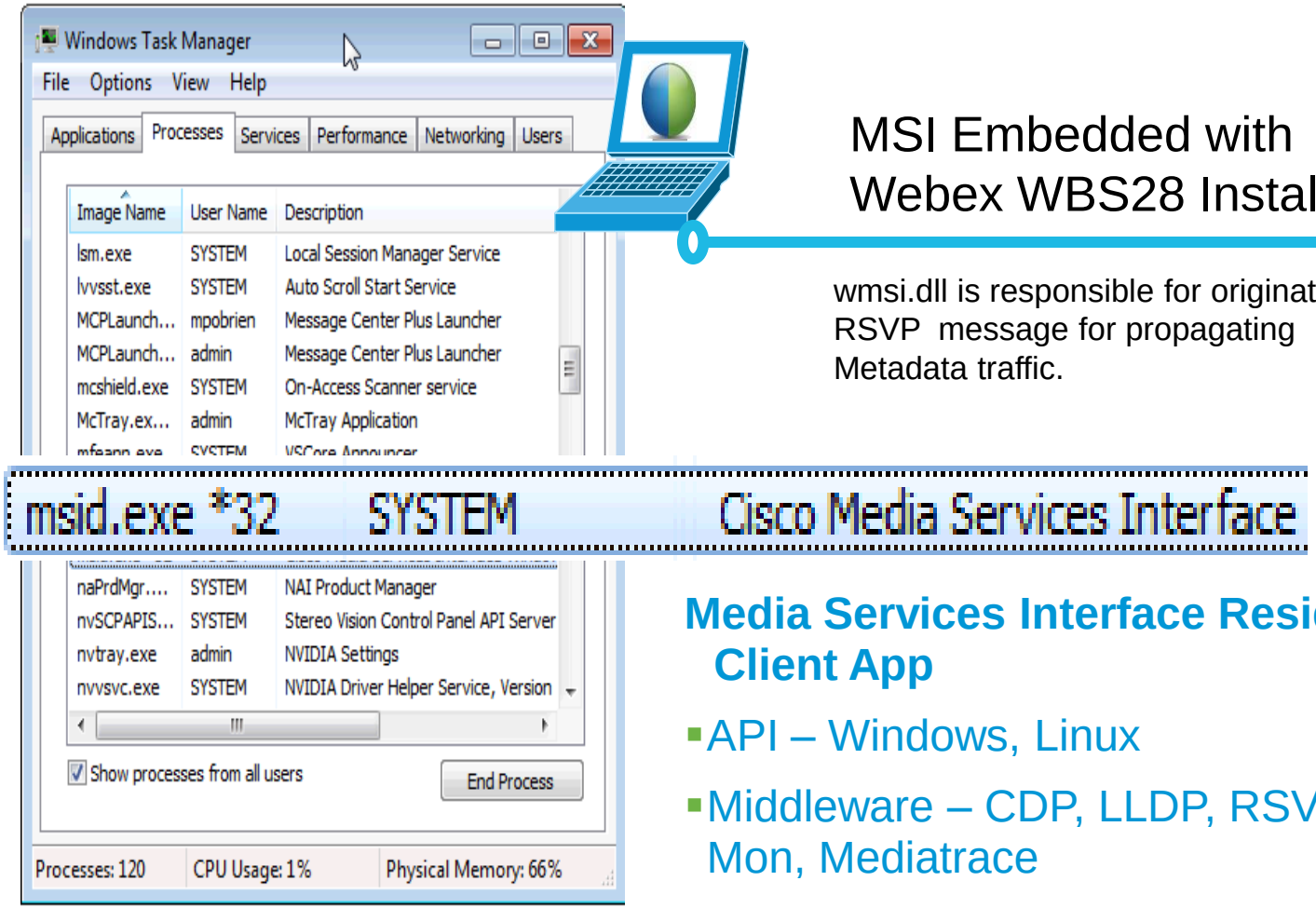
Required Software and License Feature for **Medianet Media Awareness**



Reference: http://www.cisco.com/en/US/prod/collateral/routers/ps10536/data_sheet_c78-612429.html

Flow Metadata Producer

Cisco WebEx WBS28 : MSI.exe Flow Metadata Originator



MSI Embedded with Webex WBS28 Installation

wmsi.dll is responsible for originating RSVP message for propagating Metadata traffic.

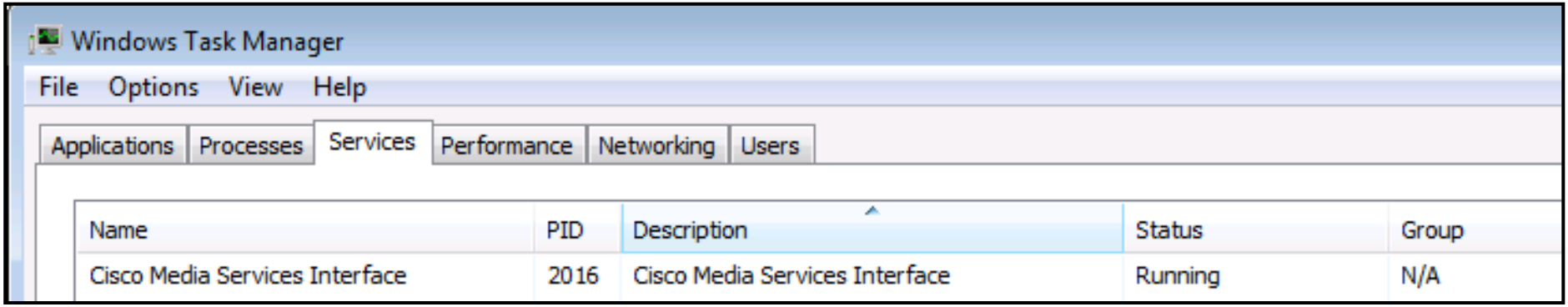
Media Services Interface Resides in WebEx Client App

- API – Windows, Linux
- Middleware – CDP, LLDP, RSVP, DHCP, Perf-Mon, Mediatrace
- Host Stack/Service Protocols

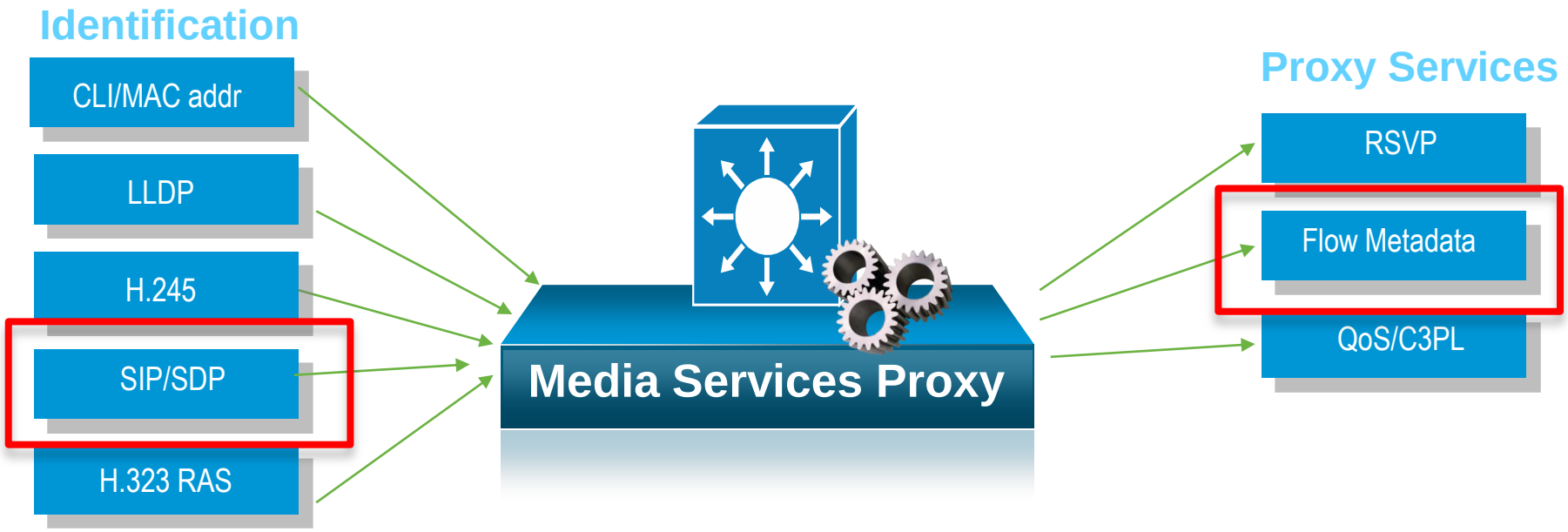
MSI on PCs

- Middleware – CDP, LLDP, RSVP, DHCP, Perf-Mon, Mediatrace
- PC based Applications (WebEx, Jabber for Windows)
  - Separate download on CCO (yes, it's really 'MSI.msi'!)
  - Needs Administrator Rights
  - Runs as Windows Service
  - Shared by all MSI-aware applications MSI services enabled (eg. CDP)

```
3945-BB0206-sw#show cdp neighbors fast0/6 detail

-------------------------

Device ID: MEDIANET-SITE

Entry address(es):
  IPv6 address: FE80::E499:2FBE:56A3:663A(link-local)
  IP address: 10.4.9.12
Platform: MSI on Windows,
Capabilities: Host
Interface: FastEthernet0/6,
Port ID (outgoing port): Local Area Connection
Holdtime : 165 sec
Version :
Microsoft Windows Vista Business Edition (build 6000)
64 bit

advertisement version: 2

Management address(es):
```



Media Service Proxy as Metadata Producer



- **Provides Medianet Services on behalf of Non-MSI enabled devices**
- **Deployed at the Access Layer of the Network**

http://www.cisco.com/en/US/prod/collateral/routers/ps10536/data_sheet_c78-612429.html

CAT4K:
Min IOS 15.1(1)SG
Feature: Flow Metadata/MSP
IP Base or Higher

Metadata Signaling RSVP Transport


```
⊞ RSVP Header. PATH Message.
⊞ SESSION: IPv4, Destination 128.107.241.169, Protocol 6, Port 80.
⊞ HOP: IPv4, 10.87.80.138
⊞ TIME VALUES: 30000 ms
⊟ SENDER TEMPLATE: IPv4, Sender 10.87.80.138, Port 57489.
    Length: 12
    Object class: SENDER TEMPLATE object (11)
    C-type: 1 - IPv4
    Sender IPv4 address: 10.87.80.138 (10.87.80.138)
    Sender port number: 57489
⊞ SENDER TSPEC: IntServ, Token Bucket, 0 bytes/sec.
⊞ ADSPEC
⊟ Unknown object
    Length: 236
    Object class: Unknown (234)
    Data (232 bytes)
```

```
0190  65 62 65 78 2d 6d 65 65  74 69 6e 67 03 54 32 38
01a0  1b 77 65 62 65 78 2d 6d  65 65 74 69 6e 67 20 63
01b0  6c 69 65 6e 74 20 2d 20  64 61 74 61 00 00
```

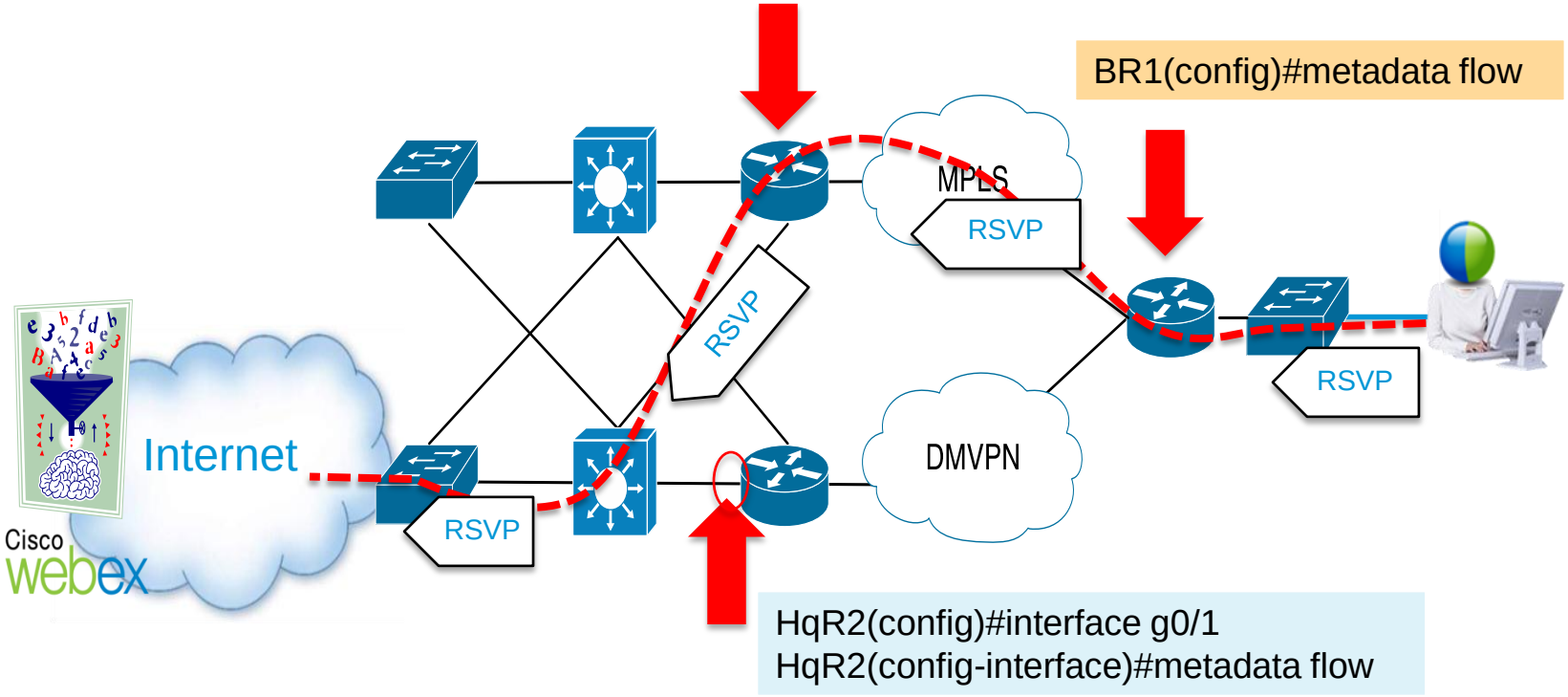
```
........ ........
........ ........
........ ........
........ ... ....
...S.... ........
...,.Z.. ........
........ ........
........ .......W
ebex-mee ting.T28
.webex-m eeting c
lient -  data..
```

Metadata AppID

Application Identifier use for traffic class identification

Configuration

Configuring Flow Metadata Awareness



- Minimum Software Release Cisco IOS 15.2(1)T or Higher
- Enable metadata flow globally, or per interface

Metadata Flow Database

Flow Metadata Table Showing Learned WebEx Flow Attributes

```
isr3925-1#show metadata flow local-flow-id 216

To              From            Protocol SPort   DPort   Ingress I/F             Egress I/F
64.68.106.197   10.87.80.130    TCP      50401   443     GigabitEthernet0/2      GigabitEthernet0/0

Metadata Attributes :

Application Tag             :   414 ()
Application Group           :   webex-group
Application Vendor          :   Cisco Systems, Inc.
Application Category        :   voice-and-video
Application Sub Category    :   control-and-signaling
Application Device Class    :   desktop-conferencing
Application Media Type      :   data
Unknown Identifier  (147)   :   [ 00 00 00 06 ]

Unknown Identifier  (148)   :   [ 00 00 00 06 ]

Unknown Identifier  (150)   :   [ 00 00 00 02 ]

Application Name            :   webex-meeting
Application Version         :   T28
End Point Model             :   webex-meeting client - data
```

5 Tuple Flow Identifier

TCP 443 indicates **SSL/TLS Encryption**

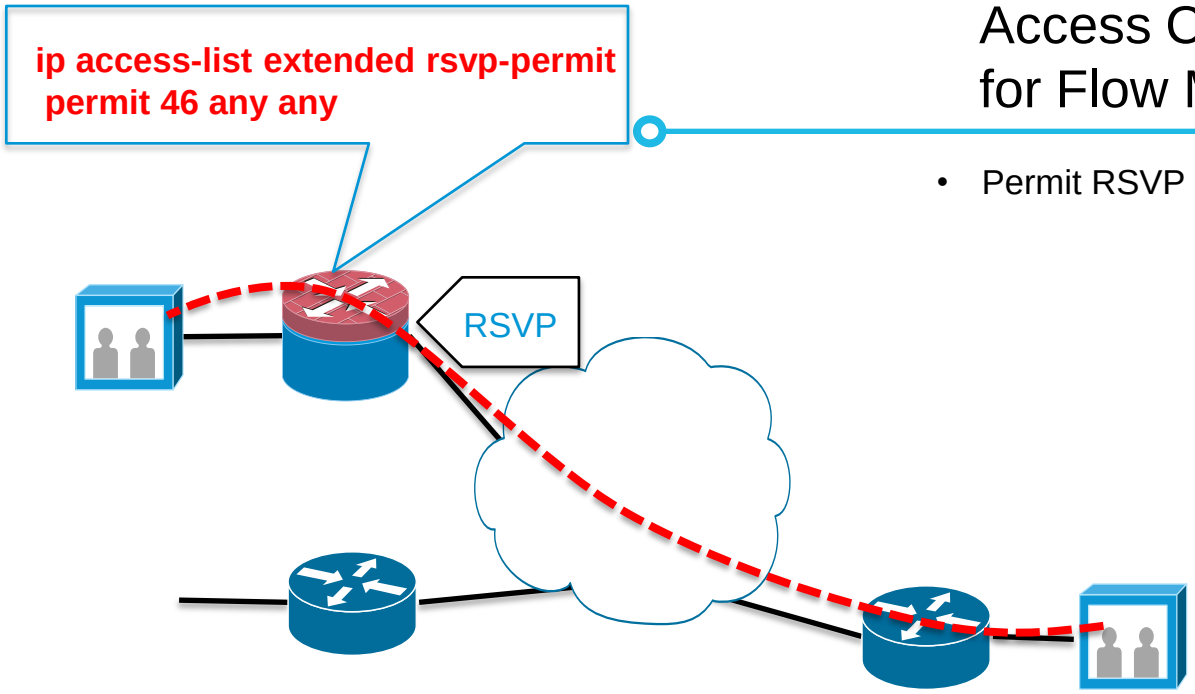
Metadata Attribute

The router learns attributes from RSVP message sent from by MSI enabled WebEx

Metadata Attribute

Flow Metadata Deployment Consideration

Firewall ACL Rules for Flow Metadata



Access Control List for Flow Metadata

- Permit RSVP message to pass

- RSVP Protocol 46 must be allowed
- RSVP Propagates Metadata For Network Device Consumption

Agenda

- Cisco Medianet Overview
- Understanding Medianet Media Awareness
- **Media Awareness Integration**

Media Awareness Integration

Simplifying QoS Deployment Strategies with Metadata

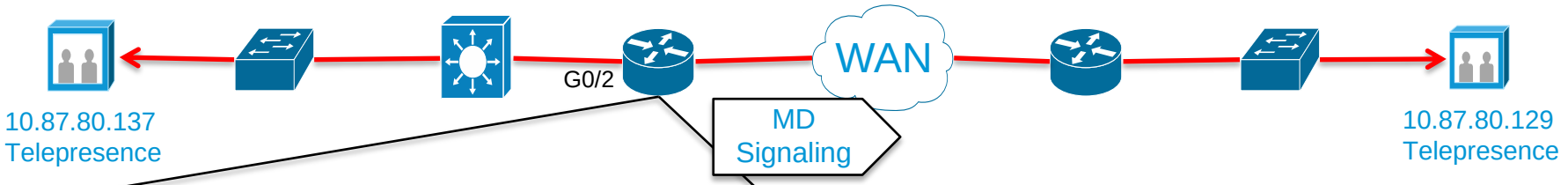
- Integrating NBAR with Flow Metadata

  Propagating attributes learned thru NBAR

- Extending QoS Trust Boundary for Priority Applications

- Attribute Base Performance Monitoring

Flow Metadata Integration with NBAR




```
ISR3925-1#show run
!
metadata flow
metadata flow transmit
!
class-map match-all Telepresence
 match application telepresence-media
!
policy-map nbar-md
 class Telepresence
!
Interface GigabitEthernet 0/2
 ip nbar protocol-discovery
 service-policy in nbar-md
```

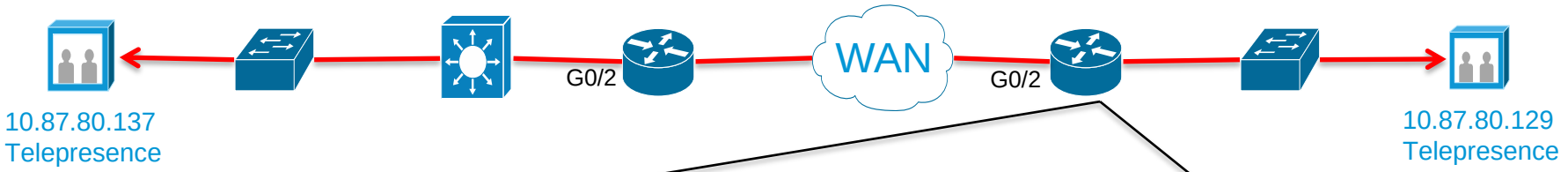
Enables metadata signalling message to propagate

Configures matching traffic class to trigger metadata signal

Applies a policy against the NBAR traffic class

NBAR enabled to discover protocol flows

Flow Metadata Integration with NBAR



isr3925-3#**show metadata flow local-flow-id 6**

To	From	Protocol	SPort	DPort	Ingress I/F	Egress I/F
10.87.93.162	10.87.80.11	UDP	25140	27812	GigabitEthernet0/2	GigabitEthernet0/1

Metadata Attributes :

Application Tag : 218103921 (telepresence-media)
Application Name : **telepresence-media**

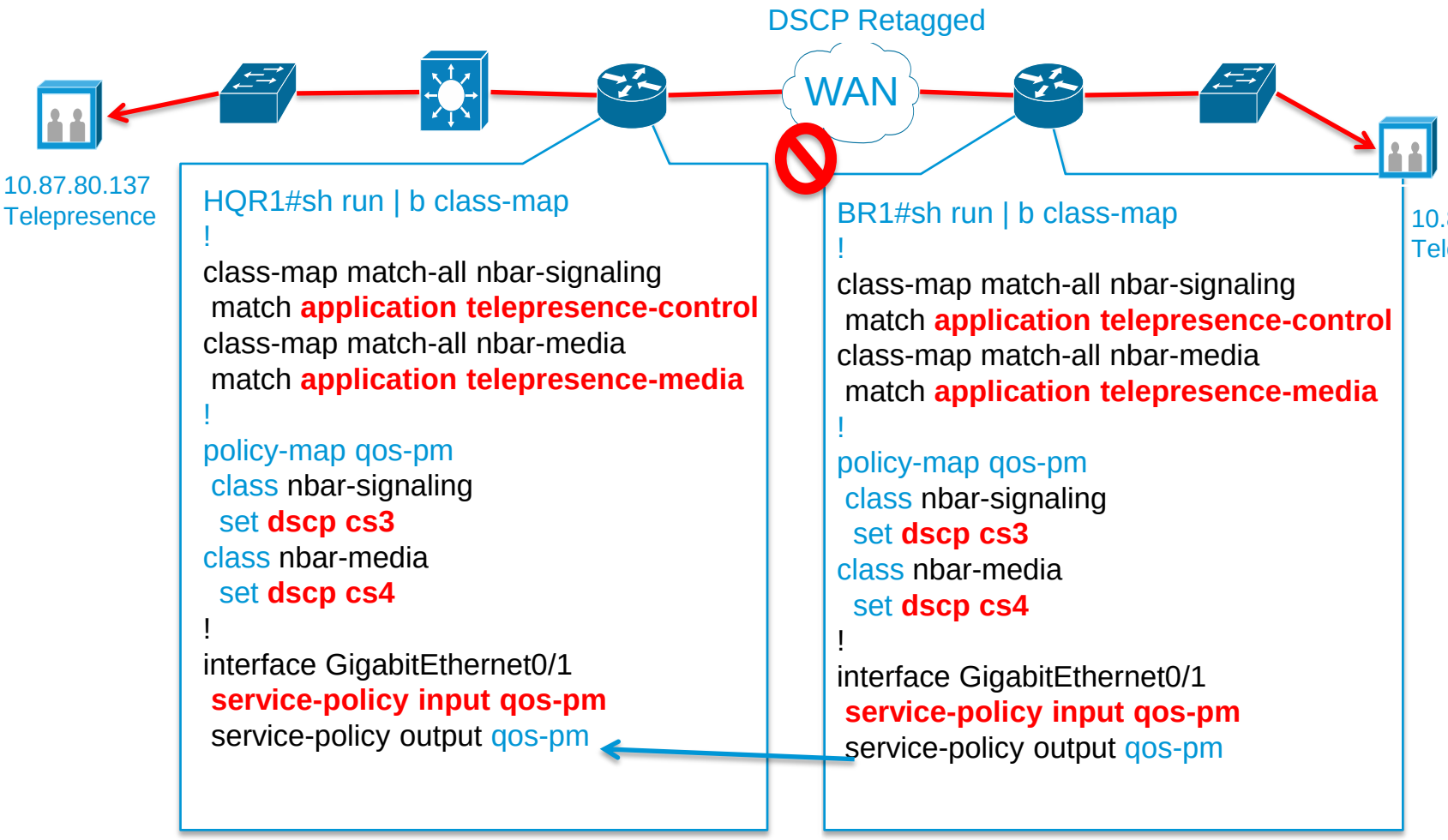
Matched filters:

Direction: IN:
Direction: OUT:
PM :
QOS : "**application telepresence-media**"

Metadata consumed by QoS CPL

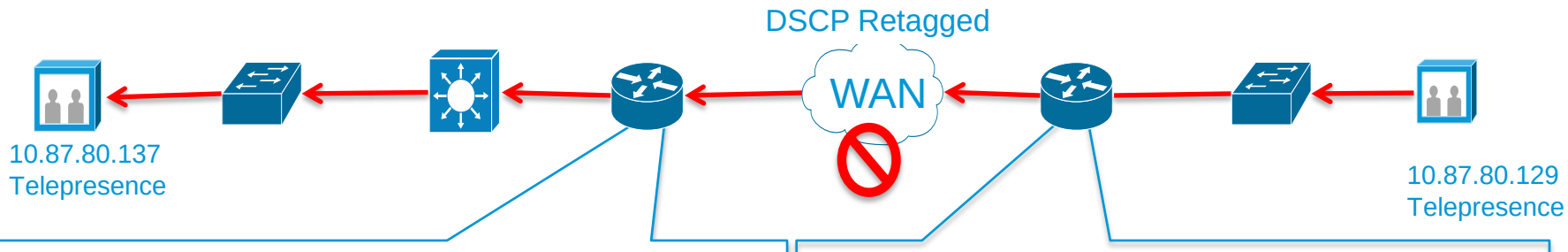
Resetting WAN Tampered QoS Values

Normalize Tampered QoS Values from WAN with Cisco Policy



Configuration

Reset WAN Tampered QoS Values



HQR1#show policy-map interface class **nbar-media**
GigabitEthernet0/0

Service-policy input: **nbar-pm**

Class-map: nbar-media (match-any)
96758 packets, 79759707 bytes
5 minute offered rate 1589000 bps, drop rate 0000 bps
Match: protocol telepresence-media
96758 packets, 79759707 bytes
5 minute rate 1589000 bps
QoS Set
dscp cs4
Packets marked 100939

BR1#show policy-map interface class **nbar-media**
GigabitEthernet0/0

Service-policy output: **nbar-pm**

Class-map: nbar-media (match-any)
103960 packets, 87490032 bytes
5 minute offered rate 1741000 bps, drop rate 0000 bps
Match: protocol telepresence-media
103960 packets, 87490032 bytes
5 minute rate 1741000 bps
QoS Set
dscp cs4
Packets marked 108408

Media Awareness Integration

Simplifying QoS Deployment Strategies with Metadata

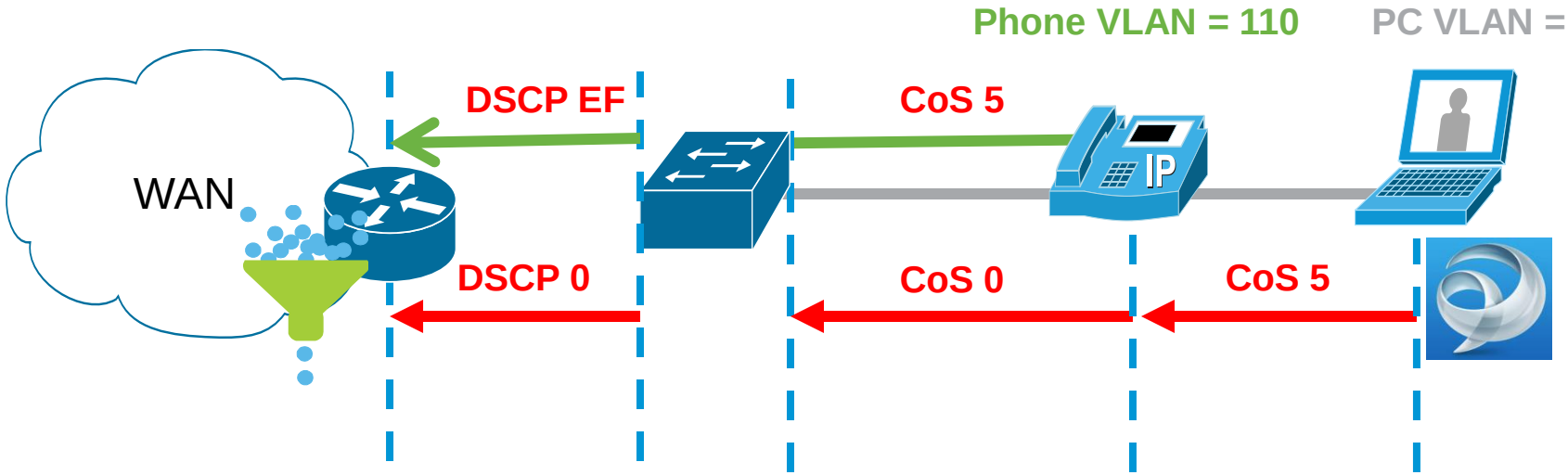
- Flow Granularity with NBAR2
- Extending QoS Trust Boundary for Priority Applications

  Collaborative Soft-clients on PCs in the Data VLAN can be serviced with QoS

- Attribute Base Performance Monitoring

Restricting Data VLAN for QoS

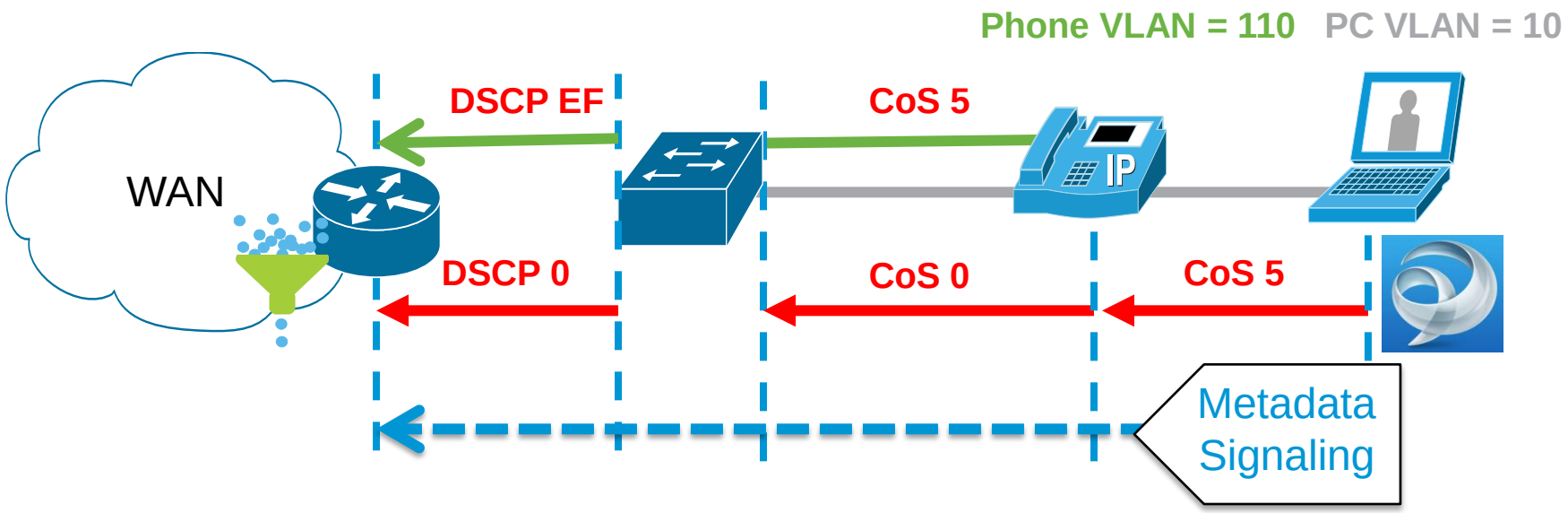
Unintended Consequences by Design



- Quality—Separation of broadcast domains i.e. phones and PCs are on separate subnets
- Security—Different network policies for different subnets; WORM attacks can be contained to the PC VLANs
- Media Applications on hosts are restricted to data vlan QoS Policies

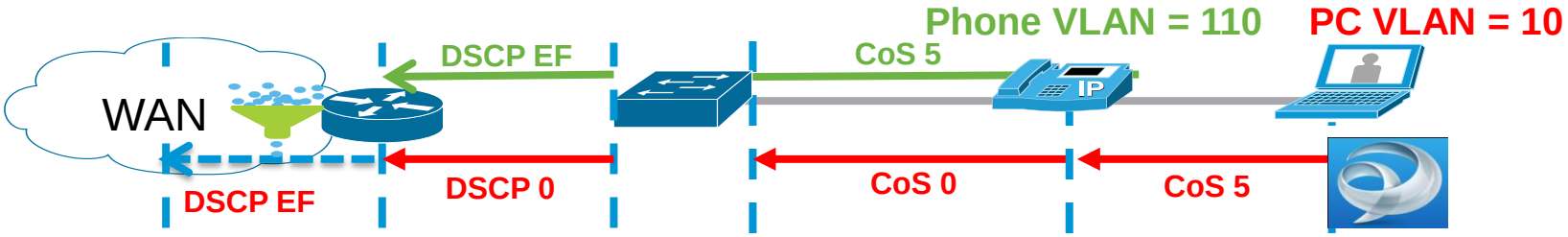
Extending QoS Trust Boundary

Trust Boundary Operation and Extension



- MSI enabled Endpoint describes application attributes to the network
- Metadata signaling propagates attributes to downstream Media Aware devices
- Devices along path Match and Apply QoS policies based on metadata attributes

Extending QoS Trust Boundary




```
Isr3925-1#show metadata flow local-flow-id 5
To                  From       Protocol  SPort     DPort     Ingress I/F                Egress I/F
64.102.38.183   10.1.1.2   UDP
24594   16384    GigabitEthernet0/1     GigabitEthernet0/2

Metadata Attributes :

Application Name              :   cisco-phone
Application Tag               :   218103889 (cisco-phone)
Application Category          :   voice-video
Application Sub Category      :   voice-video-chat-collaboration
Application Device Class      :   software-phone
Application Media Type        :   audio
End Point Model               :   Jabber for Windows
Unknown Identifier  (147)     :  [ 00 00 00 05 ]
Unknown Identifier  (148)     :  [ 00 00 00 02 ]
Application Vendor            :   Cisco Systems, Inc.
Application Version           :   Jabber 9.0.0

Matched filters :

 Direction: IN:
Direction: OUT:
 QOS         : "cisco-phone"
```

```
Isr3925-1#show run | b class-map
class-map match-all jabber
 match application cisco-phone
!
policy-map qos-md
 class jabber
  set dscp ef
!
Interface GigabitEthernet 0/2
 service-policy out qos-md
```

Media Awareness Integration with QoS

Simple and Flexible QoS Deployment with Metadata

- Flow Granularity with NBAR2

  Leverage Specific flow identification within an application stream

- Extending QoS Trust Boundary for Priority Applications

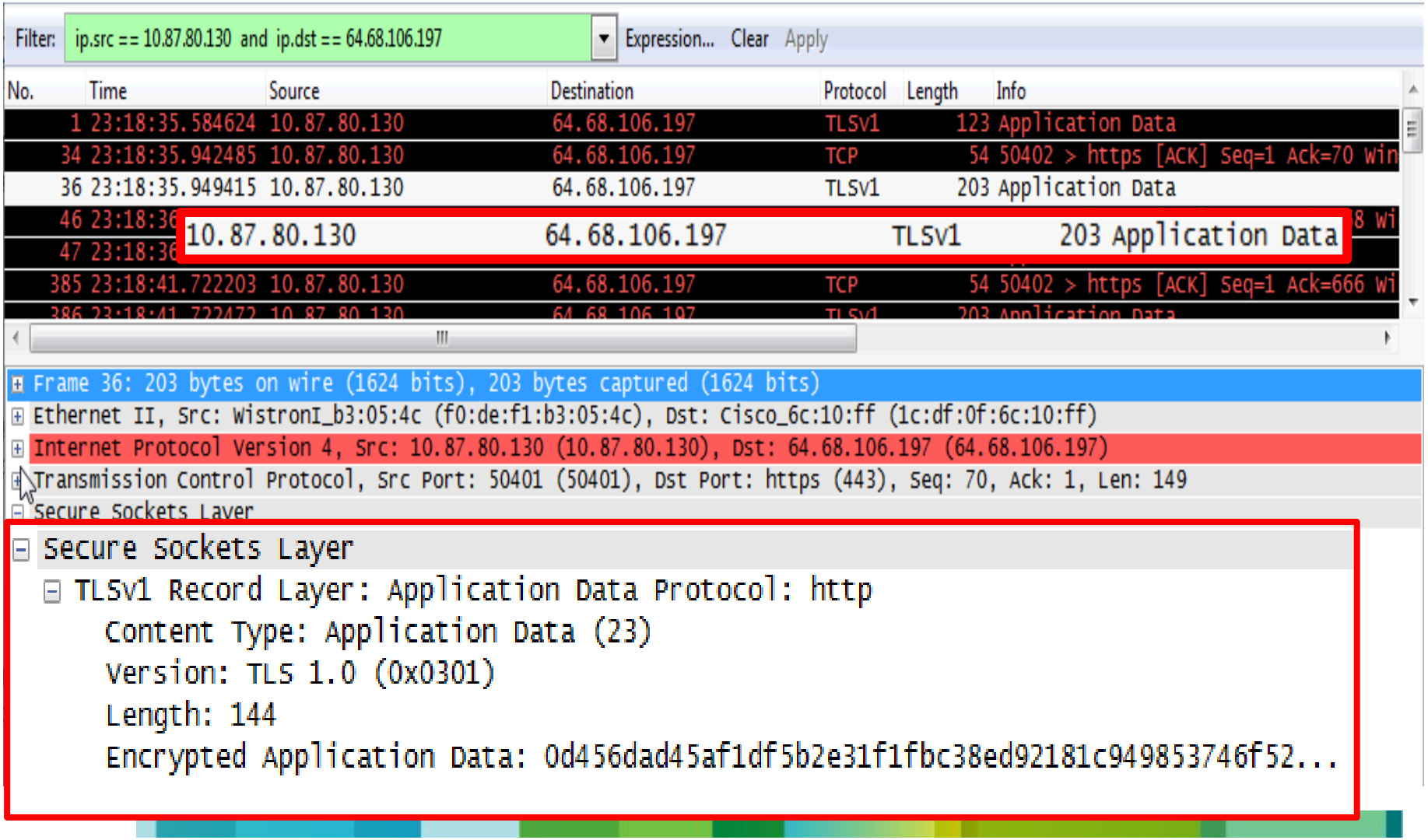
  IP Communicator on Laptops in the Data VLAN can be serviced with QoS

- Attribute Base Performance Monitoring

  Measuring network performance by attributes

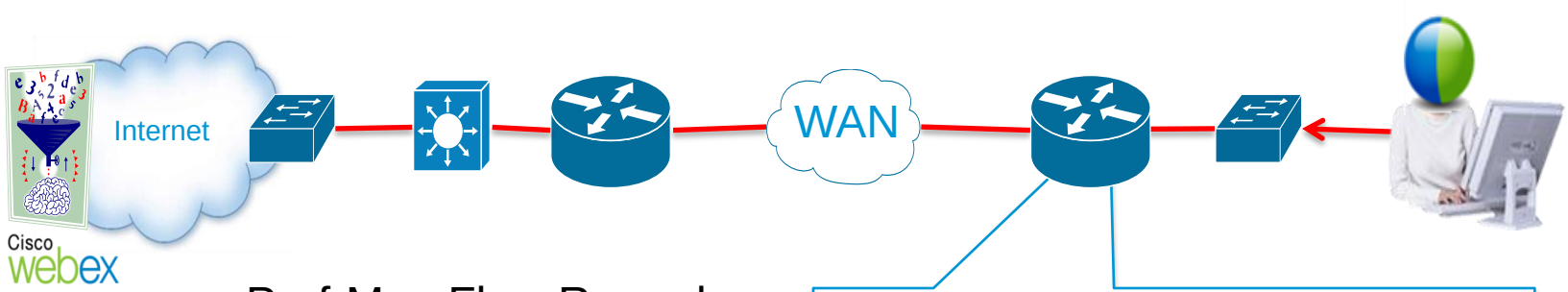
Finding WebEx in an Encrypted Flow

Trace Shows TLS Encryption Between Host and WebEx Conference Bridge



Metadata AppID with Media Monitoring

Integrating Flow Metadata with Performance Monitor Flow Record



Perf-Mon Flow Records

Configures a custom Perf-Mon Flow Record name “webex-pm”

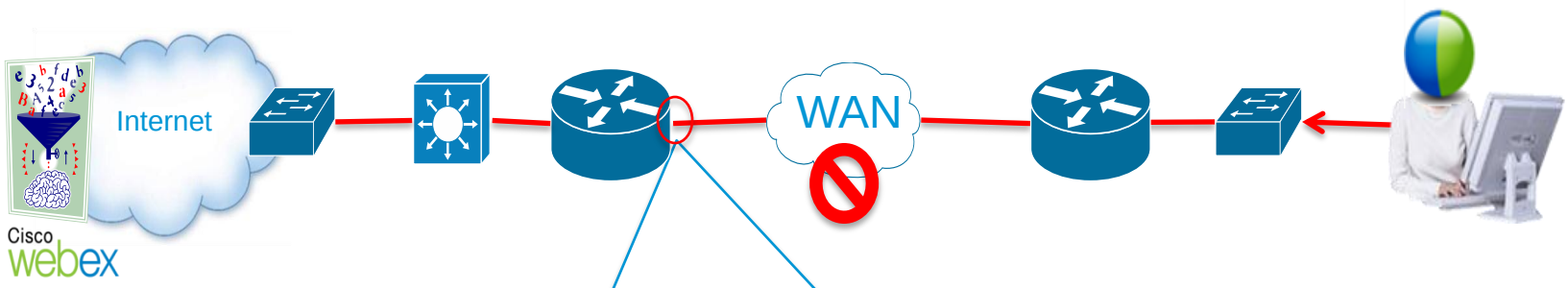
Collect Metadata Attributes

WebEx Session is **Encrypted**. Perf-Mon will collect statistics and Metadata Attributes into a single Flow Record.

```
flow record type performance-monitor webex-pm
 match ipv4 dscp
 match ipv4 protocol
 match ipv4 source address
 match ipv4 destination address
 match transport source-port
 match transport destination-port
 collect application name
 collect application version
 collect application vendor
 collect metadata global-session-id
 collect metadata clock-rate
 collect transport round-trip-time min
 collect transport round-trip-time max
 collect transport round-trip-time sum
```

Metadata AppID with Media Monitoring

Configure Cisco Policy Language to Use Flow Metadata




```
interface Gigabitethernet 0/0
 service policy type performance-mon meta-perfmon out
 service policy type performance-mon meta-perfmon in

class-map match-any webex-appId
 match application webex-meeting

policy-map type performance-monitor meta-perfmon
 class webex-appId
    flow monitor inline
    record webex-pm
```

Cisco Policy Language Recognizes WebEx Metadata

Class-map matches specific WebEx Metadata Attributes

Create Policy (Perf-Mon)

Flow Monitor now Records Perf-Mon metrics with Metadata Attributes

Metadata AppID with Media Monitoring

Integrating Performance Monitoring with Flow Metatdata


```
isr3925-1#show performance monitor status
Match: ipv4 source address = 10.87.80.130, ipv4 destination address = 64.68.106.131, transport source-port = 51344,
transport destination-port = 443, ip dscp = 0x00, ip protocol = 6,
 Policy: ipv4-v6-media, Class: webex-appId

 transport round-trip-time     (msec) : 344064
 transport round-trip-time min (msec) : NA
 transport round-trip-time max (msec) : NA
 transport round-trip-time sum (msec) : NA
 application version                  : T28
 application vendor                   : Cisco Systems, Inc.
 metadata global-session-id           : NA
 metadata clock-rate                  : 0
 application id                       : webex-meeting
```

TCP 443

HTTP over SSL/TLS

Metadata Attributes

Take Away

- Operating IP Network for Video
  - Ensuring End to End QoS with Mediatrace
  - Performance Monitoring
- Application aware network
  - Targeted service treatment with pinpoint accuracy
  - Simple when the application provides description

Additional Resources

- Medianet Support forum - https://supportforums.cisco.com/community/etc/medianet
- Medianet on Cisco.com - http://www.cisco.com/go/medianet

  Autoconfiguration: http://www.cisco.com/go/autoconfiguration

  Media Monitoring: http://www.cisco.com/go/mediamonitoring

  MSI: http://www.cisco.com/en/US/solutions/ns340/ns857/ns156/ns1094/media_services_interface.html
- Medianet Knowledge Base - http://www.cisco.com/web/solutions/medianet/knowledgebase/index.html
- SRND http://www.cisco.com/en/US/solutions/ns340/ns414/ns742/ns819/landing_vid_medianet.html
- Medianet Blogs - http://blogs.cisco.com/tag/medianet/
- Cisco Developer Network for Medianet - http://developer.cisco.com/web/mnets

Polling Question 3

From scale 1 to 5, how complicated is your organization's global QoS Policy?

a) 1

b) 2

c) 3

d) 4

e) 5

What do Cisco Medianet, New York Yankes, and the Dallas Cowboys have all in common?

Digital Media Player 4310 (part of Medianet)is a digital signage device that let businesses display and distribute content. Digital signage has been a key part of Cisco's efforts in the sports arena business, where the company has played a role in such facilities as the new Yankees Stadium and the football stadiums for the N.Y. Giants, N.Y. Jets and Dallas Cowboys.

Q & A

Use the Q&A panel to continue asking your questions

We Appreciate Your Feedback!

Those who fill out the Evaluation Survey will enter a raffle for a free:

$20 USD Gift Certificate

To complete the evaluation, please click on link provided in the chat or in the pop-up once the event is closed.

Ask The Experts Event (with Eric Yu)

If you have additional questions, you can ask them to the Eric. He will be answering questions from August 21st to August 31st.

https://supportforums.cisco.com/thread/2166625

You can watch the video or read the Q&A 5 business days after the event at
https://supportforums.cisco.com/community/netpro/ask-the-expert/webcasts

Next Expert Series Webcast - Portuguese

Topic: Basic Tools for Troubleshooting Cisco Adaptive Security Appliances (ASAs)

Tuesday, August 28, at
11:00 a.m. Brasilia City
10:00 a.m. New York
3:00 p.m. Lisbon

Join Cisco Expert:

Davi Garcia (Cisco Support Engineer, TAC Brazil)

During this live event you will get an overview of the Cisco Adaptive Security Appliances (ASAs) with Cisco expert Davi Garcia. He will show how to troubleshoot common problems using basic tools such as packet-tracer and capture. Garcia will provide a live demo during the event.

Register for this live Webcast at

http://tools.cisco.com/gems/cust/customerSite.do?METHOD=E&LANGUAGE_ID=P&PRIORITY_CODE=4&SEMINAR_CODE=S16892

Next Expert Series Webcast - English

Topic: Cable Modem Termination Systems (CMTS): Architecture, Configuration, and Troubleshooting

Wednesday September 12, at

8:00 a.m. Pacific Time

11:00 a.m. New York

5:00 p.m. Paris

Join Cisco Expert:

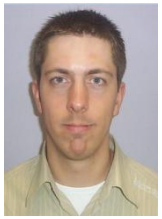
Eric Bautista

During this live event you get and overview of the Cable Modem Termination Systems and will learn about common configurations and how to troubleshoot common issues

Registration for this live Webcast opens next week at

https://supportforums.cisco.com/community/netpro/expert-corner#view=webcasts

Ask the Expert Events – Current English

Topic: Setting up and troubleshooting WCCP on IOS

Join Cisco Experts: **Peter Van Eynde and Michael Schueler**

Learn how to setup and troubleshoot WCCP (Web Cache Communication Protocol) on different IOS platforms
(This event runs until August 24th)

Topic: Understanding and Troubleshooting ACE Loadbalancer

Join Cisco Expert: **Sivakumar Sukumar**

Learn about configuration and troubleshooting on Cisco Application Control Engine (ACE) loadbalancer.
(This event runs until August 24th)

Topic: Preparing Cisco Unified Communications Manager 8.x to Support Cisco Jabber for Android/--iPhone

Join Cisco Expert: **Rajamani Nallakaruppan**

Learn to prepare Cisco Unified Communications Manager 8.x to Support Cisco Jabber for Android/--iPhone
(This event runs until August 28th)

Join the discussions of these Ask The Expert Events at:

https://supportforums.cisco.com/community/netpro/expert-corner#view=ask-the-experts

Ask the Expert Events – Starting Next Week English

Topic: RF Gateway 1 (RFGW 1) - Installation, Operation, and Troubleshooting

Join Cisco Experts: **Ron Hanson**

Learn ask questions about how to setup, operate and and troubleshoot RF Gateway 1

Topic: Intrusion Prevention System (IPS)

Join Cisco Expert: **Robert Albach**

Learn and ask questions about how to configure and trobleshoot IPS.

Join the discussions for these Ask The Expert Events at:

https://supportforums.cisco.com/community/netpro/expert-corner#view=ask-the-experts

(These events run from August 27th to September 7th)

We invite you to actively collaborate in the Cisco Support Community and social media

https://supportforms.cisco.com

http://www.facebook.com/CiscoSupportCommunity

http://twitter.com/#!/cisco_support

http://www.youtube.com/user/ciscosupportchannel

https://plus.google.com/110418616513822966153?prsrc=3#110418616513822966153/posts

http://itunes.apple.com/us/app/cisco-technical-support/id398104252?mt=8

https://play.google.com/store/apps/details?id=com.cisco.swtg_android

http://www.linkedin.com/groups/CSC-Cisco-Support-Community-3210019

Newsletter Subscription:
https://tools.cisco.com/gdrp/coiga/showsurvey.do?surveyCode=589&keyCode=146298_2&PHYSICAL%20FULFILLMENT%20Y/N=NO&SUBSCRIPTION%20CENTER=YES

We have communities in other languages

If you speak Spanish, Portuguese, Japanese, Polish or Russian, we invite you to ask your questions and collaborate in your language:

- Spanish → https://supportforums.cisco.com/community/spanish
- Portuguese → https://supportforums.cisco.com/community/portuguese
- Japanese → https://supportforums.cisco.com/community/csc-japan
- Polish → https://supportforums.cisco.com/community/etc/netpro-polska
- Russian → https://supportforums.cisco.com/community/russian

Thank You for Your Time

Please Take a Moment to Complete the Evaluation

Thank you.