

Auto Smartport with Custom Trigger Configuration Example



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Introduction

This document provides a complete example configuration that defines custom triggers for Auto Smartports. This example uses custom triggers based on the built-in device classifier. This is a good alternative for classification of non-Cisco devices when Organizationally Unique Identifiers (OUIs) cannot be used. Another alternative to the use of the built-in device classifier is to trigger based on the RADIUS attribute-value pair *auto-smart-port*=(custom event trigger). RADIUS triggers are outside the scope of this document.

Note: More information is available in the Auto Smartports Configuration Guide, Release 15.0(2)SE.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

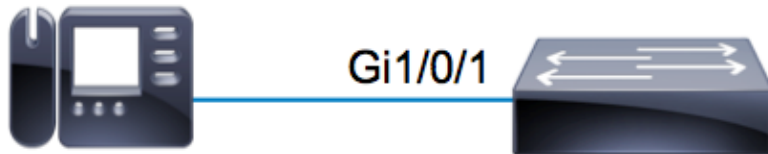
The information in this document is based on these software and hardware versions:

- Cisco Catalyst 3750-X Series Switch
- Cisco IOS® Version 15.2.1E

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Configure

Network Diagram



In this example, an Avaya IP Phone is connected on *Gi1/0/1* on a 3750X switch. This example uses the built-in device classifier and the Link Layer Discovery Protocol (LLDP) information from the phone in order to auto-configure the port.

Ensure Profiles are Present

Ensure that the device classifier has the built-in profiles for the desired device. As of Version 15.2.1E, there are over 250 built-in profiles. See the Appendix at the end of this document for the full list. The profiles are *only* bundled with the *.tar* images. Based on your version of code, the profiles are stored in either:

- *flash:<running_ios>/dc_default_profiles.txt*
- *flash:dc_profile_dir/dc_default_profiles.txt*

You can force Cisco IOS to refresh the profile list if you disable and reenable the device classifier. In this example, you want to ensure that the profiles for Avaya are present.

```
c3750x#dir flash:dc_profile_dir/
Directory of flash:dc_profile_dir/

 531  -rwx      143335  Mar 30 2011 02:14:22 +00:00  dc_default_profiles.txt

57671680 bytes total (28816384 bytes free)
```

```
c3750x(config)#no macro auto monitor
c3750x(config)#macro auto monitor
```

```
c3750x#show macro auto monitor type string Avaya
```

Valid	Type	Profile Name	min Conf	ID
Valid	Default	Avaya-Device	10	3
Valid	Default	Avaya-IP-Phone	20	4

Enable LLDP

For this example, the device classifier uses information with the LLDP frame. For this to work, LLDP must be enabled.

```
c3750x(config)# lldp run
```

Create Custom Event Trigger

The syntax for a custom trigger is *shell trigger <trigger_name> <trigger_description>*. Use the name *AVAYA_IP_PHONE* and this description: *This is for an avaya IP phone*.

```
c3750x(config)# shell processing full
c3750x(config)# shell trigger AVAYA_IP_PHONE This is for an avaya IP phone
```

Associate Trigger with Desired Profile

This example matches off the Profile Name of *Avaya-IP-Phone*, so it ties the trigger to that profile.

```
c3750x(config)# macro auto trigger AVAYA_IP_PHONE
c3750x(config-macro-trigger)# profile Avaya-IP-Phone
```

Define the Macro

The macro is the real power of Auto Smartport. The device classifier detects when a certain type of device is connected, and based on that classification, you can apply a specific configuration. This example applies a VLAN, voice VLAN, and a description to the port. When the device is removed, you remove the previously-applied configuration. This example is easily extended to include Quality of Service (QoS) and other security configurations.

```
c3750x(config)# macro auto execute AVAYA_IP_PHONE {
if [[ $LINKUP == YES ]]; then
conf t
  interface $INTERFACE
    macro description $TRIGGER
    description ***** AVAYA PHONE *****
    switchport access vlan 100
    switchport mode access
    switchport voice vlan 200
    exit
  fi
if [[ $LINKUP == NO ]]; then
conf t
  interface $INTERFACE
    no macro description $TRIGGER
    no description ***** no more avaya phone *****
    no switchport access vlan 100
    no switchport mode access
    no switchport voice vlan 200
    exit
  fi
end
}
```

Globally-Enable Macro Processing

For the events to successfully trigger, macro processing must be globally-enabled.

Note: All ports have processing enabled by default.

Before you enable macro processing globally, be sure to disable processing on ports that should be excluded via the *no macro auto processing* command.

```
c3750x(config)# macro auto global processing
```

Complete Configuration

Here is the complete configuration for this example:

```
c3750x#show run | sec lldp/shell/macro
shell processing full
shell trigger AVAYA_IP_PHONE This is for an avaya IP phone
lldp run
macro auto execute AVAYA_IP_PHONE {
  if [[ $LINKUP == YES ]]
  then conf t
  interface $INTERFACE
  macro description $TRIGGER
  description ***** AVAYA PHONE *****
  switchport access vlan 100
  switchport mode access
  switchport voice vlan 200
  exit
fi
if [[ $LINKUP == NO ]]
  then conf t
  interface $INTERFACE
  no macro description $TRIGGER
  no description ***** no more avaya phone *****
  no switchport access vlan 100
  no switchport mode access
  no switchport voice vlan 200
  exit
fi
end
macro auto trigger AVAYA_IP_PHONE
  profile Avaya-IP-Phone
macro auto global processing
```

Verify

For any shell verifications, you must first enable *Cisco IOS.sh* for the current terminal session.

```
c3750x#terminal shell
c3750x#terminal shell trace
```

In order to verify that the trigger and macro functions exist and are successfully mapped together, enter this command:

```
c3750x#show shell triggers AVAYA_IP_PHONE
User defined triggers
-----
Trigger Id: AVAYA_IP_PHONE
Trigger namespace: DEFAULT
Trigger description: This is for an avaya IP phone
Trigger mapping function:
function AVAYA_IP_PHONE_func()
{
  if [[ $LINKUP == YES ]]
  then conf t
  interface $INTERFACE
  macro description $TRIGGER
  description ***** AVAYA PHONE *****
  switchport access vlan 100
  switchport mode access
  switchport voice vlan 200
  exit
```

```

fi
if [[ $LINKUP == NO ]]
then conf t
interface $INTERFACE
no macro description $STRIGGER
no description ***** no more avaya phone *****
no switchport access vlan 100
no switchport mode access
no switchport voice vlan 200
exit
fi
end
}

```

When the port with the Avaya IP phone comes online, this sequence of events displays:

```

%LINK-3-UPDOWN: Interface GigabitEthernet1/0/1, changed state to up
%AUTOSMARTPORT-5-INSERT: Device Avaya-IP-Phone detected on interface
GigabitEthernet1/0/1,
    executed AVAYA_IP_PHONE

```

In order to verify that the device is correctly classified as *Avaya-IP-Phone*, enter this command:

```

c3750x#show macro auto monitor device interface g1/0/1
Summary:

```

MAC_Address	Port_Id	Profile Name	Device Name
(device mac)	Gil/0/1	Avaya-IP-Phone	AVAYA, INC

In order to verify that the macro configuration is successfully applied, enter this command:

```

c3750x# show run interface g1/0/1
!
interface GigabitEthernet1/0/1
description ***** AVAYA PHONE *****
switchport access vlan 100
switchport mode access
switchport voice vlan 200
macro description AVAYA_IP_PHONE
spanning-tree portfast
end

```

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Appendix

Here are the built-in device classifier profiles as of Version 15.2.1E:

```

c3750x#show macro auto monitor type
Valid      Type      Profile Name      min Conf  ID
=====
Valid      Default   Apple-Device      10        0
Valid      Default   Apple-iDevice     10        1
Valid      Default   Aruba-Device      10        2
Valid      Default   Avaya-Device      10        3
Valid      Default   Avaya-IP-Phone   20        4
Valid      Default   Brother-Device    10        5
Valid      Default   Brother-HL-3040CN-series  30        6

```

Valid	Default	Brother-HL-5370DW-series	30	7
Valid	Default	Brother-MFC-8890DW	30	8
Valid	Default	Brother-MFC-9010CN	30	9
Valid	Default	Canon-Device	10	10
Valid	Default	Canon-MF4690	30	11
Valid	Default	Cisco-Device	10	12
Valid	Default	Cisco-Router	10	13
Valid	Default	Cisco-Switch	20	14
Valid	Default	Cisco-TelePresence	30	15
Valid	Default	Cisco-IP-Camera	20	16
Valid	Default	Router	10	17
Valid	Default	Cisco-IP-Phone	20	18
Valid	Default	IP-Phone	20	19
Valid	Default	Cisco-IP-Phone-7902	70	20
Valid	Default	Cisco-IP-Phone-7905	70	21
Valid	Default	Cisco-IP-Phone-7906	70	22
Valid	Default	Cisco-IP-Phone-7910	70	23
Valid	Default	Cisco-IP-Phone-7911	70	24
Valid	Default	Cisco-IP-Phone-7912	70	25
Valid	Default	Cisco-IP-Phone-7940	70	26
Valid	Default	Cisco-IP-Phone-7941	70	27
Valid	Default	Cisco-IP-Phone-7942	70	28
Valid	Default	Cisco-IP-Phone-7945	70	29
Valid	Default	Cisco-IP-Phone-7945G	70	30
Valid	Default	Cisco-IP-Phone-7960	70	31
Valid	Default	Cisco-IP-Phone-7961	70	32
Valid	Default	Cisco-IP-Phone-7962	70	33
Valid	Default	Cisco-IP-Phone-7965	70	34
Valid	Default	Cisco-IP-Phone-7970	70	35
Valid	Default	Cisco-IP-Phone-7971	70	36
Valid	Default	Cisco-IP-Phone-7975	70	37
Valid	Default	Cisco-IP-Phone-7985	70	38
Valid	Default	Cisco-IP-Phone-9971	70	39
Valid	Default	Cisco-IP-Phone-9951	70	40
Valid	Default	Cisco-IP-Phone-8961	70	41
Valid	Default	Cisco-IP-Phone-8941	70	42
Valid	Default	Cisco-IP-Phone-8945	70	43
Valid	Default	Cisco-WLC	20	44
Valid	Default	Cisco-WLC-2100-Series	40	45
Valid	Default	Cisco-WLC-4400-Series	40	46
Valid	Default	Cisco-WLC-5500-Series	40	47
Valid	Default	Cisco-DMP	20	48
Valid	Default	Cisco-DMP-4400	70	49
Valid	Default	Cisco-DMP-4310	70	50
Valid	Default	Cisco-DMP-4305	70	51
Valid	Default	DLink-Device	10	52
Valid	Default	Enterasys-Device	10	53
Valid	Default	HP-Device	10	54
Valid	Default	HP-JetDirect-Printer	30	55
Valid	Default	HP-LaserJet-1022n	30	56
Valid	Default	HP-LaserJet-5100-Series	30	57
Valid	Default	HP-LaserJet-5200	30	58
Valid	Default	HP-LaserJet-8150-Series	30	59
Valid	Default	HP-LaserJet-9000-Series	30	60
Valid	Default	HP-LaserJet-M3027-MFP	30	61
Valid	Default	HP-LaserJet-M3035-MFP	30	62
Valid	Default	HP-LaserJet-M4345-MFP	30	63
Valid	Default	HP-LaserJet-P1505n	30	64
Valid	Default	HP-LaserJet-P2035n	30	65
Valid	Default	HP-LaserJet-P3005	30	66
Valid	Default	HP-LaserJet-P3010-Series	30	67
Valid	Default	HP-LaserJet-P4014	30	68
Valid	Default	HP-LaserJet-P4015	30	69
Valid	Default	HP-LaserJet-2420	30	70
Valid	Default	HP-LaserJet-2430	30	71
Valid	Default	HP-LaserJet-4250	30	72

Valid	Default	HP-LaserJet-4345-mfp	30	73
Valid	Default	HP-LaserJet-4350	30	74
Valid	Default	HP-Color-LaserJet-2500	30	75
Valid	Default	HP-Color-LaserJet-5550	30	76
Valid	Default	HP-Color-LaserJet-9500	30	77
Valid	Default	HP-Color-LaserJet-2600n	30	78
Valid	Default	HP-Color-LaserJet-3000	30	79
Valid	Default	HP-Color-LaserJet-3600	30	80
Valid	Default	HP-Color-LaserJet-3800	30	81
Valid	Default	HP-Color-LaserJet-4500	30	82
Valid	Default	HP-Color-LaserJet-4700	30	83
Valid	Default	HP-Color-LaserJet-CM4730-MFP	30	84
Valid	Default	HP-Color-LaserJet-CM6030-MFP	30	85
Valid	Default	HP-Color-LaserJet-CP3505	30	86
Valid	Default	HP-Color-LaserJet-CP3525	30	87
Valid	Default	HP-Color-LaserJet-CP4020-Series	30	88
Valid	Default	HP-Color-LaserJet-CP5520-Series	30	89
Valid	Default	Lexmark-Device	10	90
Valid	Default	Lexmark-Printer-E260dn	30	91
Valid	Default	Lexmark-T522	30	92
Valid	Default	Lexmark-T630	30	93
Valid	Default	Lexmark-T642	30	94
Valid	Default	Lexmark-T654	30	95
Valid	Default	Microsoft-Device	10	96
Valid	Default	Netgear-Device	10	97
Valid	Default	NintendoWII	10	98
Valid	Default	Nortel-Device	10	99
Valid	Default	Nortel-IP-Phone-2000-Series	20	100
Valid	Default	SonyPS3	10	101
Valid	Default	XBOX360	20	102
Valid	Default	Xerox-Device	10	103
Valid	Default	Xerox-Printer-Phaser3250	30	104
Valid	Default	Xerox-DocuColor-8080-Digital-Press	30	105
Valid	Default	Xerox-FaxCentre-2218	30	106
Valid	Default	Xerox-Igen4-Press	30	107
Valid	Default	Xerox-Phaser-3200mfp	30	108
Valid	Default	Xerox-Phaser-3300mfp	30	109
Valid	Default	Xerox-Phaser-3500dn	30	110
Valid	Default	Xerox-Phaser-3600	30	111
Valid	Default	Xerox-Phaser-3635mfp	30	112
Valid	Default	Xerox-Phaser-4600	30	113
Valid	Default	Xerox-Phaser-4620	30	114
Valid	Default	Xerox-Phaser-5550dt	30	115
Valid	Default	Xerox-Phaser-6010n	30	116
Valid	Default	Xerox-Phaser-6110	30	117
Valid	Default	Xerox-Phaser-6110mfp	30	118
Valid	Default	Xerox-Phaser-6115mfp	30	119
Valid	Default	Xerox-Phaser-6128mfp-n	30	120
Valid	Default	Xerox-Phaser-6130n	30	121
Valid	Default	Xerox-Phaser-6140dn	30	122
Valid	Default	Xerox-Phaser-6180mfp-d	30	123
Valid	Default	Xerox-Phaser-6280dn	30	124
Valid	Default	Xerox-Phaser-6280n	30	125
Valid	Default	Xerox-Phaser-6360dx	30	126
Valid	Default	Xerox-Phaser-6360n	30	127
Valid	Default	Xerox-Phaser-6500dn	30	128
Valid	Default	Xerox-Phaser-6500n	30	129
Valid	Default	Xerox-Phaser-6700dx	30	130
Valid	Default	Xerox-Phaser-7400dx	30	131
Valid	Default	Xerox-Phaser-7400dx-f	30	132
Valid	Default	Xerox-Phaser-7500dt	30	133
Valid	Default	Xerox-Phaser-7500dx	30	134
Valid	Default	Xerox-Phaser-7760dx	30	135
Valid	Default	Xerox-Phaser-7760dx-Pcl-5c	30	136
Valid	Default	Xerox-Phaser-7760gx	30	137
Valid	Default	Xerox-Phaser-8500n	30	138

Valid	Default	Xerox-Phaser-8550dp	30	139
Valid	Default	Xerox-Phaser-8550dt	30	140
Valid	Default	Xerox-Phaser-8560	30	141
Valid	Default	Xerox-Phaser-8560dn	30	142
Valid	Default	Xerox-Phaser-8560dx	30	143
Valid	Default	Xerox-Phaser-8860	30	144
Valid	Default	Xerox-Phaser-8860mfp	30	145
Valid	Default	Xerox-WorkCentre-3045ni	30	146
Valid	Default	Xerox-WorkCentre-3210	30	147
Valid	Default	Xerox-WorkCentre-3220	30	148
Valid	Default	Xerox-WorkCentre-3550	30	149
Valid	Default	Xerox-WorkCentre-4118-Series	30	150
Valid	Default	Xerox-WorkCentre-4250	30	151
Valid	Default	Xerox-WorkCentre-4260	30	152
Valid	Default	Xerox-WorkCentre-5020-dn	30	153
Valid	Default	Xerox-WorkCentre-5030	30	154
Valid	Default	Xerox-WorkCentre-5135	30	155
Valid	Default	Xerox-WorkCentre-5225	30	156
Valid	Default	Xerox-WorkCentre-5225a	30	157
Valid	Default	Xerox-WorkCentre-5632	30	158
Valid	Default	Xerox-WorkCentre-5655	30	159
Valid	Default	Xerox-WorkCentre-5675	30	160
Valid	Default	Xerox-WorkCentre-5687	30	161
Valid	Default	Xerox-WorkCentre-5735	30	162
Valid	Default	Xerox-WorkCentre-5755	30	163
Valid	Default	Xerox-WorkCentre-5765	30	164
Valid	Default	Xerox-WorkCentre-5790	30	165
Valid	Default	Xerox-WorkCentre-6015n	30	166
Valid	Default	Xerox-WorkCentre-6400s	30	167
Valid	Default	Xerox-WorkCentre-6400x	30	168
Valid	Default	Xerox-WorkCentre-6400xf	30	169
Valid	Default	Xerox-WorkCentre-6505dn	30	170
Valid	Default	Xerox-WorkCentre-6505n	30	171
Valid	Default	Xerox-WorkCentre-7120	30	172
Valid	Default	Xerox-WorkCentre-7132-Multifunction-Syst	30	173
Valid	Default	Xerox-WorkCentre-7242	30	174
Valid	Default	Xerox-WorkCentre-7345	30	175
Valid	Default	Xerox-WorkCentre-7346	30	176
Valid	Default	Xerox-WorkCentre-7428	30	177
Valid	Default	Xerox-WorkCentre-7435	30	178
Valid	Default	Xerox-WorkCentre-7535	30	179
Valid	Default	Xerox-WorkCentre-7556	30	180
Valid	Default	Xerox-WorkCentre-7675	30	181
Valid	Default	Xerox-WorkCentre-7755	30	182
Valid	Default	Xerox-WorkCentre-7775	30	183
Valid	Default	Xerox-WorkCentre-M118	30	184
Valid	Default	Xerox-WorkCentre-M20	30	185
Valid	Default	Xerox-WorkCentre-M20i	30	186
Valid	Default	Xerox-WorkCentre-Pro-133	30	187
Valid	Default	Xerox-WorkCentre-Pro-C3545	30	188
Valid	Default	Xerox-4127	30	189
Valid	Default	Xerox-700-Digital-Color-Press	30	190
Valid	Default	Xerox-Color-1000-Press	30	191
Valid	Default	Xerox-Color-560	30	192
Valid	Default	Xerox-ColorQube-8570dn	30	193
Valid	Default	Xerox-ColorQube-8570dt	30	194
Valid	Default	Xerox-ColorQube-8570dx	30	195
Valid	Default	Xerox-ColorQube-8700X	30	196
Valid	Default	Xerox-ColorQube-8870	30	197
Valid	Default	Xerox-ColorQube-9202	30	198
Valid	Default	Xerox-ColorQube-9203	30	199
Valid	Default	Xerox-ColorQube-9301	30	200
Valid	Default	Aruba-AP	20	201
Valid	Default	Cisco-Access-Point	10	202
Valid	Default	Cisco-IP-Conference-Station-7935	70	203
Valid	Default	Cisco-IP-Conference-Station-7936	70	204

Valid	Default	Cisco-IP-Conference-Station-7937	70	205
Valid	Default	DLink-DAP-1522	20	206
Valid	Default	Cisco-AP-Aironet-1130	30	207
Valid	Default	Cisco-AP-Aironet-1240	30	208
Valid	Default	Cisco-AP-Aironet-1250	30	209
Valid	Default	Cisco-AIR-LAP	25	210
Valid	Default	Cisco-AIR-LAP-1130	30	211
Valid	Default	Cisco-AIR-LAP-1240	50	212
Valid	Default	Cisco-AIR-LAP-1250	50	213
Valid	Default	Cisco-AIR-AP	25	214
Valid	Default	Cisco-AIR-AP-1130	30	215
Valid	Default	Cisco-AIR-AP-1240	50	216
Valid	Default	Cisco-AIR-AP-1250	50	217
Invalid	Default	Sun-Workstation	10	218
Valid	Default	Linksys-Device	20	219
Valid	Default	LinksysWAP54G-Device	30	220
Valid	Default	HTC-Device	10	221
Valid	Default	MotorolaMobile-Device	10	222
Valid	Default	VMWare-Device	10	223
Valid	Default	ISE-Appliance	10	224
Valid	Default	Konica-Device	10	225
Valid	Default	Konica-Minolta-Bizhub-C280	30	226
Valid	Default	Konica-Minolta-Bizhub-C650	30	227
Valid	Default	RICOH-Device	10	228
Valid	Default	RICOH-Aficio-MP-5000	30	229
Valid	Default	RICOH-Aficio-MP-5001	30	230
Valid	Default	RICOH-Aficio-MP-C2050	30	231
Valid	Default	RICOH-Aficio-MP-C2550	30	232
Valid	Default	RICOH-Aficio-MP-C4501	30	233
Valid	Default	RICOH-Aficio-SP-C410DN	30	234
Valid	Default	Samsung-Device	10	235
Valid	Default	Samsung-ML-2855-Series	30	236
Valid	Default	Samsung-CLP-310-Series	30	237
Valid	Default	Philips-Device	10	238
Valid	Default	Surveillance-Camera	10	239
Valid	Default	AXIS-Camera	20	240
Valid	Default	Pelco-Camera	20	241
Valid	Default	Video-Conference	20	242
Valid	Default	Radvision-VCF	20	243
Valid	Default	Polycom-VCF	20	244
Valid	Default	Draeger-Device	10	245
Valid	Default	Polycom-Device	10	246
Valid	Default	WYSE-Device	10	247
Valid	Built-in	Cisco-Device	10	0
Valid	Built-in	Cisco-Router	10	1
Valid	Built-in	Router	10	2
Valid	Built-in	Cisco-IP-Camera	10	3
Valid	Built-in	Cisco-IP-Camera-2xxx	30	4
Valid	Built-in	Cisco-IP-Camera-2421	50	5
Valid	Built-in	Cisco-IP-Camera-2500	50	6
Valid	Built-in	Cisco-IP-Camera-2520	50	7
Valid	Built-in	Cisco-IP-Camera-2530	50	8
Valid	Built-in	Cisco-IP-Camera-4xxx	50	9
Valid	Built-in	Cisco-Transparent-Bridge	8	10
Valid	Built-in	Transparent-Bridge	8	11
Valid	Built-in	Cisco-Source-Bridge	10	12
Valid	Built-in	Cisco-Switch	10	13
Valid	Built-in	Cisco-IP-Phone	20	14
Valid	Built-in	IP-Phone	20	15
Valid	Built-in	Cisco-DMP	10	16
Valid	Built-in	Cisco-DMP-4305G	70	17
Valid	Built-in	Cisco-DMP-4310G	70	18
Valid	Built-in	Cisco-DMP-4400G	70	19
Valid	Built-in	Cisco-WLC-2100-Series	40	20
Valid	Built-in	Cisco-Access-Point	10	21
Valid	Built-in	Cisco-AIR-LAP	30	22

Valid	Built-in	Cisco-AIR-AP	30	23
Valid	Built-in	Linksys-Device	20	24
Valid	Built-in	Surveillance-Camera	10	25
Valid	Built-in	AXIS-Camera	20	26
Valid	Built-in	Pelco-Camera	20	27
Valid	Built-in	Video-Conference	20	28
Valid	Built-in	Radvision-VCF	20	29
Valid	Built-in	Polycom-VCF	20	30
Valid	Built-in	CUPC-VCF	20	31

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