Appendix I

Information about Design of Public Wi-Fi System Terminal 2

This appendix includes the following documents:

- General information about the T2 Wi-Fi design, prepared by NetXperts, including a list of the hardware components (Table 1) and Power and Rack Specifications (Table 2).
- An accompanying table with more information about the system components.
- A diagram illustrating the general system architecture.

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SFO T2
Public Area Wi-Fi Design

In order to accommodate the SFO T2 Public Area Wi-Fi network operating on a connected but parallel infrastructure, design considerations not limited to rack space, power, fiber, hardware, etc. will need to be taken into account.

The proposed public coverage area includes Sectors 1, 2, 10 and 11 at the public escalator and elevator areas and the curb side on the first level and all inside areas and the curbside on the second level. The following bullet points detail the SFO T2 Public Area Wi-Fi network design.

- 67 Wi-Fi access points located in the defined public coverage area will be patched over to new Power over Ethernet (PoE) Cisco switches in SSR rooms.
- The new Cisco POE switches that will be installed in the SSR rooms will be patched over to new Distribution switches in the two main SSR rooms.
- Each core distribution switch in the main SSR rooms will connect to the T2 distribution switches via single mode fiber.
- Cisco Wireless Controllers will be installed in the same room as that of the Core distribution switch of the public Wi-Fi network. These controllers will manage the LWAPP APs of the public are. Each controller will be connected with single mode fiber to each distribution core switch of the public infrastructure.
- A Cisco Wireless Control System (WCS) will be installed in one of the rooms that hosts the Distribution switch of the Public Area Wi-Fi network. The WCS will provide a central interface to manage Wireless Controllers and access points.
- Minimum 12 strands of fiber (single mode) are needed from between the rooms that host the Distribution switches for the public Wi-Fi network. Minimum 12 stands of fiber are needed between the Main SSR rooms and the rooms that host the Distribution switches of the public Wi-Fi network.
- The new Public Wi-Fi infrastructure will connect back to the T-Mobile network via Single Mode fiber. All routing will be done on the existing T-mobile network and will access a separate internet connection.

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- The Wi-Fi access point placement for the Public Area Wi-Fi network has already been determined as a result of a completed Wireless Assessment and the details are available as needed.
- Please see Table 1 below for list of Public Wi-Fi network hardware and Table 2 below for list of power and rack specifications.

Table 1: List of Public Wi-Fi Network Hardware

Name	Catalog Num	Vendor	Description	Qty
AIR-CT5508-50-K9	AIR-CT5508-50-K9	Cisco	5508 Series Controller for up to 50 APs	2
LIC-CT5508-50	LIC-CT5508-50	Cisco	50 AP Base license	2
LIC-CT5508-BASE	LIC-CT5508-BASE	Cisco	Base Software License	2
AIR-PWR-CORD-NA	AIR-PWR-CORD-NA	Cisco	AIR Line Cord North America	2
CON-SNT-CT0850	CON-SNT-CT0850	Cisco	SMARTNET 8X5XNBD 5508 Series Controll	4
GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver	8
SWC5500K9-60	SWC5500K9-60	Cisco	Cisco Unified Wireless Controller SW Release 6.0	2
L-LIC-CT5508-UPG	L-LIC-CT5508-UPG	Cisco	Primary SKU for CT5508 upgrade licenses (Delivery via Email)	1
CON-SNT-LCT25A	CON-SNT-LCT25A	Cisco	SMARTNET 8X5XNBD 25 AP Adder License for the 5508	8
L-LIC-CT5508-25A	L-LIC-CT5508-25A	Cisco	25 AP Adder License for the 5508 Controller (eDelivery)	4
WS-C3750G-12S-E	WS-C3750G-12S-E	Cisco	Catalyst 3750 12 SFP + IPS Image	2
CAB-AC	CAB-AC	Cisco	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	2
CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable	2
CON-SNT-3750G12E	CON-SNT-3750G12E	Cisco	SMARTNET 8X5XNBD Cat 3750 12 SFP Enhanced Multilayer Img	4
GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver	24
WS-C3750G-12S-E	WS-C3750G-12S-E	Cisco	Catalyst 3750 12 SFP + IPS Image	2
CAB-AC	CAB-AC	Cisco	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m	2

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CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable	2
CON-SNT-3750G12E	CON-SNT-3750G12E	Cisco	SMARTNET 8X5XNBD Cat 3750 12 SFP Enhanced Multilayer Img	4
GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver	16
GLC-T=	GLC-T=	Cisco	1000BASE-T SFP	4
WS-C3750G-24PS-S	WS-C3750G-24PS-S	Cisco	Catalyst 3750 24 10/100/1000T PoE + 4 SFP + IPB Image	4
CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable	4
CAB-16AWG-AC	CAB-16AWG-AC	Cisco	AC Power cord, 16AWG	4
CON-SNT-3750G24P	CON-SNT-3750G24P	Cisco	SMARTNET 8X5XNBD Cat 3750 24 10/100/1000T PoE + 4 SF	8
GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver	8
WS-C3750E-24PD-SF	WS-C3750E-24PD-SF	Cisco	Catalyst 3750E 24 10/100/1000 PoE+2*10GE(X2),1150W,IPB s/w	6
CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable	6
CVR-X2-SFP	CVR-X2-SFP	Cisco	TwinGig Converter Module	12
S3750EVT-12235SE	S3750EVT-12235SE	Cisco	CAT 3750E IOS UNIVERSAL W/O CRYPTO	6
CAB-16AWG-AC	CAB-16AWG-AC	Cisco	AC Power cord, 16AWG	6
CON-SNT-3750E2PS	CON-SNT-3750E2PS	Cisco	SMARTNET 8X5XNBD WS-C3750E-24PD-SF	12
GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver	12
WCS-STANDARD-K9	WCS-STANDARD-K9	Cisco	WCS Top Level SKU for AP capacity options.	1
CON-SAU-WCSP100	CON-SAU-WCSP100	Cisco	SW APP SUPP + UPGR Cisco WCS with PLUS	2
WCS-PLUS-100	WCS-PLUS-100	Cisco	Cisco WCS with PLUS License for 100 APs, Windows/Linux	1
WCS server	WCS server	IBM	IBM server	1
AIR-LAP1142N-A-K9	AIR-LAP1142N-A-K9		802.11A/G/N FIXED UNIFIEDAP INT ANT FCC CFG	5
AIR-LAP1252AG-A-K9	AIR-LAP1252AG-A-	Cisco	802.11A/G/N FIXED UNIFIEDAP INT ANT FCC	6

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	K9		CFG	
AIR-ANT2422DG-R	AIR-ANT2422DG-R	Cisco	2.4-GHz 2.2 dBi Dipole Straight Antenna RP-TNC Gra	18
AIR-ANT5135DG-R AIR-ANT5135DG-R	AIR-ANT5135DG-R	Cisco	5-GHz 3.5 dBi Dipole Straight Antenna RP-TNC Gray	18
CON-SNT-1142NAK	CON-SNT-L1142A0P	Cisco	SMARTnet 8X5XNBD AIR-LAP1142N-A-K9	10
CON-SNT-LAP1252A	CON-SNT-LAP1252A	Cisco	SMARTNET 8X5XNBD 802.11a/g/n-d2.0	12
Mounting Brackets	Mounting Brackets	Custom	Mounting Brackets	6
Nema Enclosures	Nema Enclosures	NEMA	Nema Enclosures	6

Table 2: Power and Rack Specifications

Model	Rack Units (RU)	Dimension	Power	Amps per device	Power Cord,	Output Circuits from UPS to equipment
WS-C3750E-24PD-S	1	H x W x D: 1.73 x 17.5 x 16.1 in.		10	NEMA 5-15 to IEC-C19 13ft US	4.0-8.0A
WS-C3750G-24PS-S	1	H x W x D: 1.73 x 17.5 x 16.1 in.	115-240 VAC, 50-60 Hz	10	NEMA 5-15 to IEC-C19 13ft US	4.0-8.0A
WS-C3750G-12S-E	1	H x W x D: 1.73 x 17.5 x 12.8 in	12.0A (100 VAC), 4.9A (200 VAC)	12	NEMA 5-15 to IEC-C19 13ft US	15AMP/110V Circuit
5508-50-K9	1	H x W x D: 17.30 x 21.20 x 1.75 in.	100 to 240 VAC; 50/60 Hz; 1.05 A at 110 VAC, 115 W Maximum; 0.523 A at 220 VAC, 115 W Maximum;	2	AIR-PWR-CORD-NA	2 - 1AMP/110V Circuit
WCS Server	3			5		1 - 5AMP/110V circuit

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T.2.1.EOO9 SSR-ER/TR

ITEM	Name	Catalog Num	Vendor	Description		Qty
1	**AIR-CT5508-50-K9**	AIR-CT5508-50-K9	Cisco	5508 Series Controller for up to 50 APs		1
	LIC-CT5508-50	LIC-CT5508-50	Cisco	50 AP Base license		1
	LIC-CT5508-BASE	LIC-CT5508-BASE	Cisco	Base Software License		1
	AIR-PWR-CORD-NA	AIR-PWR-CORD-NA	Cisco	AIR Line Cord North America		1
	CON-SNT-CT0850	CON-SNT-CT0850	Cisco	SMARTNET 8X5XNBD 5508 Series Controll		2
	GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver		4
	SWC5500K9-60	SWC5500K9-60	Cisco	Cisco Unified Wireless Controller SW Release 6.0		1
	L-LIC-CT5508-UPG	L-LIC-CT5508-UPG	Cisco	Primary SKU for CT5508 upgrade licenses (Delivery via Email)		1
	CON-SNT-LCT25A	CON-SNT-LCT25A	Cisco	SMARTNET 8X5XNBD 25 AP Adder License for the 5508		4
	L-LIC-CT5508-25A	L-LIC-CT5508-25A	Cisco	25 AP Adder License for the 5508 Controller (eDelivery)		2
2	**WS-C3750G-12S-E**	WS-C3750G-12S-E	Cisco	Catalyst 3750 12 SFP + IPS Image		2
	CAB-AC	CAB-AC	Cisco	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m		2
	CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable		2
	CON-SNT-3750G12E	CON-SNT-3750G12E	Cisco	SMARTNET 8X5XNBD Cat 3750 12 SFP Enhanced Multilayer Img		4
	GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver		24
1	**WCS-STANDARD-K9**	WCS-STANDARD-K9	Cisco	WCS Top Level SKU for AP capacity options.		1
	CON-SAU-WCSP100	CON-SAU-WCSP100	Cisco	SW APP SUPP + UPGR Cisco WCS with PLUS		2
	WCS-PLUS-100	WCS-PLUS-100	Cisco	Cisco WCS with PLUS License for 100 APs, Windows/Linux		1
	WCS server	WCS server	IBM	IBM server		1

1	**WS-C3750G-24PS-S**	WS-C3750G-24PS-S	Cisco	Catalyst 3750 24 10/100/1000T PoE + 4 SFP + IPB Image		1
	CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable		1
	CAB-16AWG-AC	CAB-16AWG-AC	Cisco	AC Power cord, 16AWG		1
	CON-SNT-3750G24P	CON-SNT-3750G24P	Cisco	SMARTNET 8X5XNBD Cat 3750 24 10/100/1000T PoE + 4 SF		2
	GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver		2

5

T.2.1.EO10 SSR-ER/TR

	Name	Catalog Num	Vendor	Description		Qty
1	**AIR-CT5508-50-K9**	AIR-CT5508-50-K9	Cisco	5508 Series Controller for up to 50 APs		1
	LIC-CT5508-50	LIC-CT5508-50	Cisco	50 AP Base license		1
	LIC-CT5508-BASE	LIC-CT5508-BASE	Cisco	Base Software License		1
	AIR-PWR-CORD-NA	AIR-PWR-CORD-NA	Cisco	AIR Line Cord North America		1
	CON-SNT-CT0850	CON-SNT-CT0850	Cisco	SMARTNET 8X5XNBD 5508 Series Controll		2
	GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver		4
	SWC5500K9-60	SWC5500K9-60	Cisco	Cisco Unified Wireless Controller SW Release 6.0		1
	L-LIC-CT5508-UPG	L-LIC-CT5508-UPG	Cisco	Primary SKU for CT5508 upgrade licenses (Delivery via Email)		1
	CON-SNT-LCT25A	CON-SNT-LCT25A	Cisco	SMARTNET 8X5XNBD 25 AP Adder License for the 5508		4
	L-LIC-CT5508-25A	L-LIC-CT5508-25A	Cisco	25 AP Adder License for the 5508 Controller (eDelivery)		2

2	**WS-C3750G-12S-E**	WS-C3750G-12S-E	Cisco	Catalyst 3750 12 SFP + IPS Image		2
	CAB-AC	CAB-AC	Cisco	AC Power Cord (North America), C13, NEMA 5-15P, 2.1m		2
	CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable		2
	CON-SNT-3750G12E	CON-SNT-3750G12E	Cisco	SMARTNET 8X5XNBD Cat 3750 12 SFP Enhanced Multilayer Img		4
	GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver		24

WS-C3750G-24PS-S	WS-C3750G-24PS-S	Cisco	Catalyst 3750 24 10/100/1000T PoE + 4 SFP + IPB Image		1
CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable		1
CAB-16AWG-AC	CAB-16AWG-AC	Cisco	AC Power cord, 16AWG		1
CON-SNT-3750G24P	CON-SNT-3750G24P	Cisco	SMARTNET 8X5XNBD Cat 3750 24 10/100/1000T PoE + 4 SF		2
GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver		2

ROOMS

T.2.1.E109 SSR-TR

T.2.2.E109 SSR-TR

WS-C3750G-24PS-S	WS-C3750G-24PS-S	Cisco	Catalyst 3750 24 10/100/1000T PoE + 4 SFP + IPB Image		1
CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable		1
CAB-16AWG-AC	CAB-16AWG-AC	Cisco	AC Power cord, 16AWG		1
CON-SNT-3750G24P	CON-SNT-3750G24P	Cisco	SMARTNET 8X5XNBD Cat 3750 24 10/100/1000T PoE + 4 SF		2
GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver		2

ROOMS

T.2.1.E303 SSR-TR

T.2.1.E308 SSR-TR

T.2.1.E016 SSR-TR

T.2.1.E309 SSR-TR

T.2.2.E112 SSR-TR

T.2.2.E145 SSR-TR

WS-C3750G-24PS-S

WS-C3750E-24PD-SF	WS-C3750E-24PD-SF	Cisco	Catalyst 3750E 24 10/100/1000 PoE+2*10GE(X2),1150W,IPB s/w		1
CAB-STACK-50CM	CAB-STACK-50CM	Cisco	Cisco StackWise 50CM Stacking Cable		1
CVR-X2-SFP	CVR-X2-SFP	Cisco	Cisco TwinGig Converter Module		2
S3750EVT-12235SE	S3750EVT-12235SE	Cisco	CAT 3750E IOS UNIVERSAL W/O CRYPTO WITH WEB BASED DEV MGR		1
CAB-16AWG-AC	CAB-16AWG-AC	Cisco	AC Power cord, 16AWG		1
CON-SNT-3750E2PS	CON-SNT-3750E2PS	Cisco	SMARTNET 8X5XNBD WS-C3750E-24PD-SF		2
GLC-LH-SM=	GLC-LH-SM=	Cisco	GE SFP,LC connector LX/LH transceiver		2

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T-Mobile Network

T2-1E009-3750 G
SSR-ER

T2-1E010-3750 G
SSR-ER

Wireless LAN Controller

Wireless LAN Controller

Wireless Control System

T2-1E009-3750
SSR-TR
Ports 24

T2-1E109-3750
SSR-TR
Ports 24

T2-2E109-3750
SSR-TR
Ports 24

T2-1E303-3750
SSR-TR
Ports 24

T2-1E308-3750
SSR-TR
Ports 24

T2-1E309-3750
SSR-TR
Ports 24

T2-1E010-3750
SSR-TR
Ports 24

T2-1E016-3750
SSR-TR
Ports 24

T2-2E112-3750
SSR-TR
Ports 24

T2-1E145-3750
SSR-TR
Ports 24

LWAPP

Approximately 10 Access Pointss

Approximately 2 Access Points

Approximately 5 Access Points

Approximately 7 Access Points

Approximately 4 Access Points

Approximately 7 Access Points

Approximately 12 Access Points

Approximately 5 Access Points

Approximately 6 Access Points

Approximately 9 Access Points

Legend

Primary Trunk Link

Secondary Trunk Link

Primary Non-Trunk Link

Secondary Non-Trunk Link

IPS

Switch

Firewall

Switch

Router

Title:	**SFO Public Wi-Fi**
Engineer: **Robert Crabbe**	Drawing: **Logical Diagram**
Approved By: **Jason Blick**	Date: **6/16/2010**
Accepted By: **Gary Nordine**	Pages: **Page 1 of 2**

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T-Mobile Network

T2-1E009-3750 G
SSR-ER

T2-1E010-3750 G
SSR-ER

2/0/2
2/0/3
2/0/2
2/0/3

G 0/0 — 1/0/11 — 1/0/12 — 1/0/12 — 1/0/11 — G 0/0

Wireless LAN Controller

Wireless LAN Controller

2/0/1
G 0/0
2/0/1
1/0/26

Wireless Control System

1/0/1
1/0/25
1/0/1
1/0/26
1/0/10
1/0/10
1/0/25
1/0/26

1/0/2 1/0/3 1/0/2 1/0/4 1/0/3 1/0/5 1/0/4 1/0/6 1/0/5 1/0/7 1/0/6 1/0/8 1/0/7 1/0/9 1/0/8 1/0/9

1/0/25 1/0/26 1/0/25 1/0/26 1/0/25 1/0/26 1/0/25 1/0/26 1/0/25 1/0/26 1/0/25 1/0/26 1/0/25 1/0/26

T2-1E009-3750
SSR-TR
Ports 24

T2-1E145-3750
SSR-TR
Ports 24

T2-1E109-3750
SSR-TR
Ports 24

T2-2E109-3750
SSR-TR
Ports 24

T2-1E303-3750
SSR-TR
Ports 24

T2-1E308-3750
SSR-TR
Ports 24

T2-1E309-3750
SSR-TR
Ports 24

T2-1E010-3750
SSR-TR
Ports 24

T2-1E016-3750
SSR-TR
Ports 24

T2-2E112-3750
SSR-TR
Ports 24

Legend

Primary Trunk Link | Secondary Trunk Link | Primary Non-Trunk Link | Secondary Non-Trunk Link | IPS | Switch | Firewall | Switch | Router

Title:	SFO Public Wi-Fi
Engineer: Robert Crabbe	Drawing: Physical Diagram
Approved By: Jason Blick	Date: 6/16/2010
Accepted By: Gary Nordine	Pages: Page 2 of 2

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