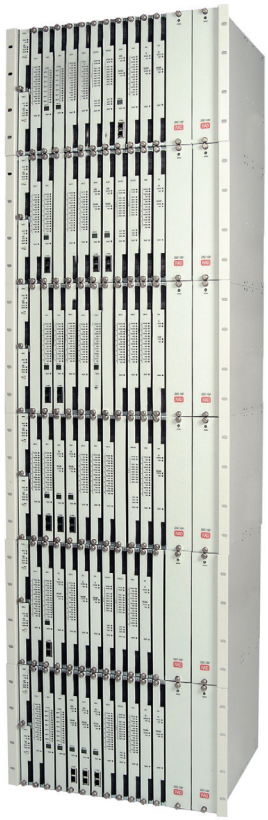
Data Sheet

DXC-100

Multiservice Access Node

3/1/0 modular multiservice cross connect access node – up to 1.2 Gbps matrix



- Modular Multiservice Access Node
- Carrier class 3/1/0 non-blocking cross-connect
- 256 Mbps to 1.2 Gbps matrix
- Expandable (stackable) 6U-high units with 11 I/O slots in each unit
- Up to eight units stack to support the following services: up to 640 n × 56/64 kbps, 688 E1/T1, 80 E3/T3, 32 STM-1/OC-3, and 80 channelized routers

RAD data communications
The Access Company

DXC-100

Multiservice Access Node

The modular 6U high DXC-100 is the latest addition to the DXC family of multiservice access nodes. Each chassis supports up to 80 n × 56/64 kbps, 88 E1/T1, 11 E3/T3, or 4 STM-1/OC-3 links. Up to eight chassis can be stacked to support up to 640 n × 56/64 kbps, 688 E1/T1, 80 E3/T3 or 32 STM-1/OC-3 lines, for a powerful, central site solution.

The scalable platform enables carriers to deploy a system with low entry cost to meet their current requirements, and then add additional chassis and modules as their customer base grows.

DXC-100 satisfies the access needs of wireless and wireline operators in a wide range of broadband and narrowband applications for carriers, cellular operators, ISPs, utility companies, and enterprises.

Applications include:

- E1/T1 conversion between two ports of the same module
- High-speed access to a carrier's digital backbone
- E3/T3/STM-1/OC-3 conversion
- Grooming fractional trunks into full trunks
- Maximizing data traffic payload over E1, T1, E3, T3, STM-1, or OC-3 trunks
- Grooming monitoring signals for QoS or advanced services.

DXC-100 optimizes the network by consolidating E1 and T1 functionality in a single, cost-effective, managed device. Operating as a digital cross-connect, DXC-100 provides 3/1/0 non-blocking switching that is comparable to larger, more costly systems.

DXC-100 can also aggregate Ethernet traffic (for example, ISP or corporate traffic) from several remote sites via different trunks into one stream, by using the channelized router module.

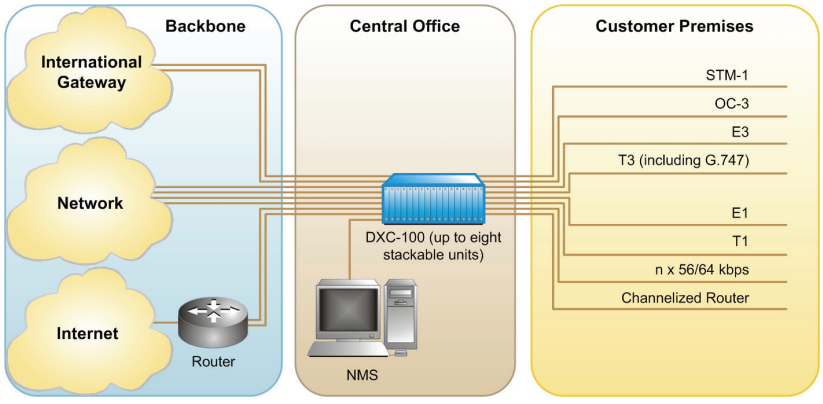


Figure 1. Multiservice Access Platform

BASIC UNITS

The basic DXC-100 chassis is 6U-high (10.5 inches). The chassis includes eleven I/O slots for plug-in interface module sets.

Each module set consists of a front main module and a rear interface module.

The power supply and system manager modules are not provided with the chassis and must be ordered separately. Optional redundancy for the system manager and power supply modules is available.

The chassis can be mounted in a 19-inch wide rack. Optional 23-inch flush and 23-inch center mount brackets are also available.

Up to 8 DXC-100 units can be stacked in a star topology. Nest 1 is a master unit, while Nests 2 to 8 are slave units. The master unit has a different main system manager module (DXNM) and an additional expansion module (DXCC). The slave units have the same main system manager module (DSMC.2), and an additional stack controller module (DXLC).

When a standalone unit is expanded into a stack, all of its modules are used and no resources are wasted.

SYSTEM MANAGER MODULES

A standalone DXC-100 requires one or two DSMC.2 half-height main modules and one DSMC.2 full-height interface module.

Nest 1 in a DXC-100 stack requires one or two (recommended) half-height DXNM main modules with one full height DSMC.2 interface module and one or two (recommended) full-height DXCC main and interface modules.

Nests 2 to 8 require one or two DSMC.2 half-height main modules and one or two (recommended) full-height DXLC main modules. The DSMC.2 interface module is optional and intended for use only when the DXC-100PSX is used. For each of the DXLC modules, a D8E1T1 interface module can be installed at the rear of the chassis, to provide additional 8 E1/T1 ports each.

DSMC.2 MAIN MODULE

A standalone unit, as well as Nests 2 to 8 of stacked units, use the half-height DMSC.2 system management main module, placed in a specially designed slot. Two such slots are available for optional system redundancy. The DSMC.2 module can generate a Stratum 3 clock source.

DSMC.2 INTERFACE MODULE

A single full-height interface module supports up to two DSMC.2 or DXNM main modules and is rear-mounted into a dedicated slot. The interface module contains management 10/100BaseT Ethernet and supervision terminal ports, a phone line (connected to internal modem) and critical/major/minor alarm dry contacts.

Table 1. DXC-100 System Capacity

Ports	1 Unit Standalone	8 Units Stacked
n × 56/64 kbps	80	640
E1, T1	88	688
E3, T3	11	80
STM-1, OC-3	4	32
Router	80	640

Figure 2. DXC-100PSX

DXC-100

Multiservice Access Node

DXNM MAIN MODULE

Nest 1 of the stacked units uses the half height DXMN system management main module instead of the DSMC.2 module. The DXMN module is placed in a specially designed slot. Two such slots are available for optional system redundancy. The DXNM module provides a Stratum 3 or external clock to all units. The interface module for Nest 1 is the same as for a standalone unit (DSMC.2).

DXCC AND DXLC MAIN AND INTERFACE MODULES

Matrix expansion modules are the DXCC module for Nest 1 and the DXLC module for Nests 2 to 8. The DXCC and DXLC modules are connected via an external cable. The DXCC module creates a transparent switch fabric for a non-blocking 3/1/0 cross-connect between any ports of the stacked units.

REDUNDANCY (OPTIONAL)

DXC-100PSX is an optional redundant protection switch unit adjunct to the DXC-100. It provides automatic protection services for E1/T1 and/or DE3/DT3 services in a user-selectable N:1 manner. It occupies only 3U of vertical space directly above the DXC-100 chassis and features fail-safe switch and fan operation.

DXC-100PSX supports up to a 10:1 protection ratio for the D8E1T1 module, up to 6:1 and an additional 3:1 ratio for DE3 or DT3 modules in a single 11-slot unit. Each DXC-100 unit can use only one DXC-100PSX.

The system manager module, DXC-100PSX-NC is connected to the DXC-100 unit by a special cable. The system manager module (one per unit) and the –48 VDC power supply modules (one or two per unit) must be ordered separately.

I/O MODULES

A DXC-100 standalone unit holds up to eleven module sets consisting of a front main module and a rear interface module. Up to eight DXC-100 units in a stack accommodate a maximum of 86 module sets.

DSTM-1 is a single-port STM-1 module that provides SDH Path Terminating Equipment (PTE) functionality for DXC-100. The DSTM-1 module can transmit and terminate any timeslot from up to 84 T1 or 63 E1 channels per STM-1 facility. Mixed E1 and T1 traffic applications are supported. 1:1 redundancy is achieved when used together with an STM-1 module set in an adjacent slot.

DOC-3 is a single-port OC-3 module that provides SONET PTE functionality for DXC-100. DOC-3 can transmit and terminate any timeslot from up to 84 T1 links per OC-3 facility. 1:1 redundancy is provided when used with a companion OC-3 module set in an adjacent slot.

DT3 is a single-port T3 interface module that multiplexes any timeslot from up to 28 T1 links or 21 E1 links into a single T3 stream with either C-bit parity or M13 framing. Mixed (E1 and T1) traffic applications are supported as per ITU G.747. The module has integral BERT and supports loopback diagnostics. Hardware redundancy up to 6:1 is available via DXC-100PSX.

DE3 is a single-port E3 interface module that allows DXC-100 to transmit and terminate an E3 link. It also multiplexes and demultiplexes any timeslot from up to 16 E1 links. The module has an integral BERT and supports loopback diagnostics. Hardware redundancy up to 6:1 is available via DXC-100PSX.

D8E1T1 is an 8-port E1/T1 module that supports up to eight E1 or T1 links in any combination with D4, ESF, or G.70x framing and AMI, B8ZS, or HDB3 line coding. The module has an integral BERT and supports loopback diagnostics. Hardware redundancy up to 10:1 is available via DXC-100PSX.

D8HS is an eight-port n × 56/64 kbps data module with eight high-speed synchronous data channels. The electrical interface for each port can be configured independently for RS-530, RS-530A, RS-449/422, RS-232, V.35 or X.21 interfaces at the system console.

DROUTER is a 32-channel (2 Mbps) channelized router hub module that allows DXC-100 to perform the functions of a channelized, multiprotocol router. DROUTER can be used for inband management of remote units. It supports up to 32 individual channels (1 to 32 timeslots) for IP/IPX routing, including multiple protocols and additional features, such as NAT. An integral SNMP agent is provided. The rear interface card supports 8-port 10/100BaseT LAN hub functionality and detects status of up to three external contact closures.

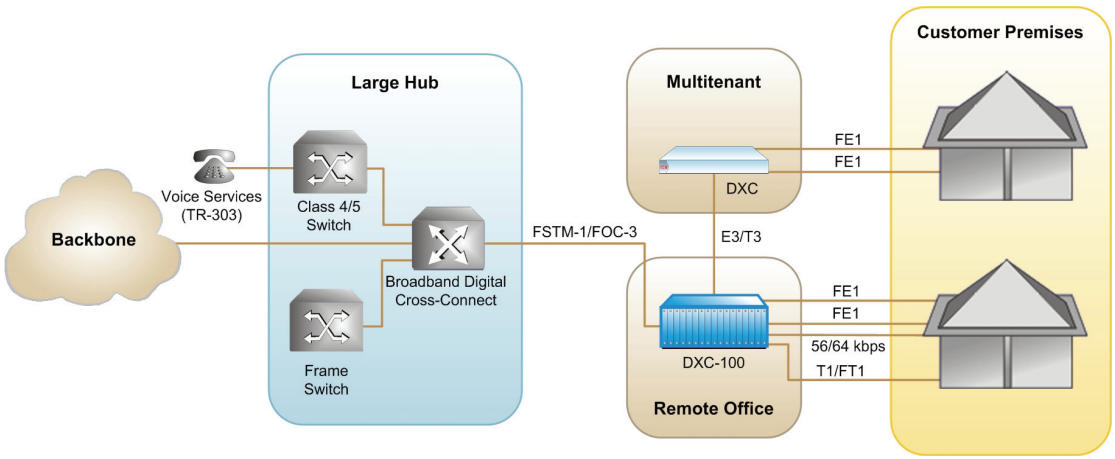


Figure 3. Remote Grooming

DXC-100

Multiservice Access Node

MANAGEMENT

DXC-100 can be managed via the following options:

- ASCII terminal
- Telnet
- RADview-PC™ or RADview-HPOV™ SNMP central network management system.

Note: *An activation key licence must be ordered to manage DXC-100 in RADview.*

Local and remote configuration and diagnostics reduce operating expenses, eliminate costly technician visits, and maximize network performance and uptime.

Inband management, that enables management of other RAD remote products, is supported via the DROUTER module.

DXC-100 utilizes an embedded SNMP agent that provides basic system resource monitoring, event notification, diagnostics, performance monitoring, and provisioning. Per the appropriate RFC standards,

SNMP uses UDP protocol to send and receive data. The agent can be configured to allow only selected and authorized devices to view or change information. DXC-100 supports upload and download of its configuration.

The set of read/write parameters allows for basic slot configuration, circuit/connection set-up for all five cross-connection maps, system clock and source assignment as well as D8E1T1, DE3, DT3 and D8HS data application module provisioning. A set of read-only parameters allows for monitoring system status and alarms, as well as performing limited diagnostics.

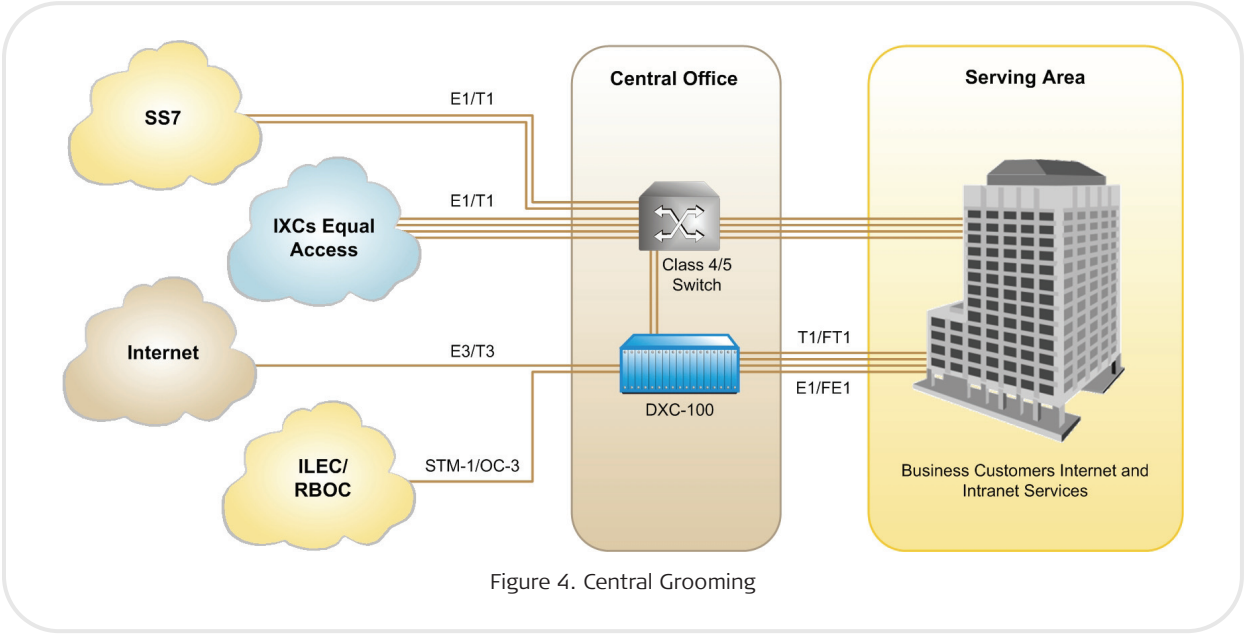


Figure 4. Central Grooming

All DXC-100 and DXC-100PSX management functions are performed on the standalone unit's DSMC.2 system manager module or the stack's DXNM master system manager module. In both cases the same rear DSMC.2 interface module is used. The DSMC.2 has the following physical management ports:

- Supervision terminal: VT-100 compliant serial data interface for local access
- Dial-in modem: integral auto-answer modem for remote dial-up access
- 10/100BaseT Ethernet: IP-based LAN connection supporting local or remote multiple Telnet sessions or EMS access via SNMP.

In addition, the DSMC.2 rear interface module contains dry contacts for sending alarms.

DIAGNOSTICS

All the modules posses a comprehensive suite of integral diagnostic tools that are controlled from any of the management interfaces. These diagnostics conform to the appropriate international standards for testing such applications.

Each I/O module supports a number of embedded loopbacks (local or remote) and bit error rate (BER) diagnostics. BER testing on the D8HS module is performed at n × 56/64 kbps rate.

On all other modules BER testing is performed at a framed or unframed aggregate level.

TIMING

DXC-100 can use network synchronized timing or internal timing. Network synchronized timing includes line timing that is provided via the channel cards, or external timing provided by standalone reference timing equipment (such as a Building Integrated Timing Source [BITS]). The internal timing source is a Stratum 3 clock, which can be used as a reference to generate the system clocking signals.

DXC-100 allows the selection of up to three reference clock sources. Should a reference clock fail and auto mode is configured, DXC-100 will automatically select an alternate input based on the configuration settings for the source clock.

Table 3 DXC-100 Modules

Module	Description
DSTM-1	Single-port STM-1 module
DOC-3	Single-port OC-3 module
D8E1T1	8-port E1 or T1 module, user-selectable at the port level
DE3	Single-port E3 module
DT3	Single-port T3 module including G.747 support
D8HS	8-port n × 56/64 high speed module
DROUTER	Single-port 32-channel (2 Mbps) router module

DXC-100

Multiservice Access Node

Specifications

Maximum Number of Ports
See *Table 2*

Compliance
CE, CSA, FCC, UL

Chassis
6U high, up to 8 units stackable, 11 I/O slots per chassis

Timing
Network synchronized timing:
Line timing, provided via the channel cards
External timing, provided by standalone reference timing equipment
Internal Timing: Stratum 3 clock

Diagnostics
Local and remote loopbacks and BER test on all module ports

Protection
System and power supply modules: 1:1
STM-1 and OC-3 modules: 1:1
E1/T1, E3, and T3 modules: N:1

Management Options
ASCII terminal
RADview SNMP agent
Telnet

Management Ports
RS-232
10/100BaseT Ethernet

Indicators
STATUS (per power supply)
READY, LAN, CRITL, MAJOR, MINOR (per system manager)

Push-button
ACO (Alarm cut off) momentary alarm reset (per system manager)

Physical
Height: 26.7 cm (10.5 in 6U)
Width: 43.2 cm (17 in)
Depth: 35.6 cm (14 in)
Weight: 11 kg (25 lb)(without modules)

Power Supply
100 to 240 VAC, 47 to 63 Hz
–48 VDC nominal

Power Consumption (max)
Standalone: 200W
Stacked: 288W per chassis

Environment
Temperature: 0°–50°C (32°–122°F)
Humidity: Up to 90%, non-condensing

Table 2. DXC Family Comparison Table

Features	DXC-8R	DXC-10A	DXC-30/30E	DXC-100
Height	1U	1U	3U/6U	6U per nest
Maximum number of ports	32	40	120/*	688 (8 nests)
Number of I/O slots	4	5	15	86 (8 nests)
System redundancy	Built-in	None	Optional	Optional
E1, T1, E3, T3, STM-1 modules	✓	✓	✓	✓
XDSL, inverse multiplexing modules	✓	✓	✓	–
n x 56/64 kbps modules	✓	✓	✓	✓
Router, OC-3 modules	–	–	–	✓
ASCII, SNMP, RADview management	✓	✓	✓	✓

Data Sheet

DXC-100

Multiservice Access Node

Ordering

Basic chassis, power supply, system modules, I/O modules, cables, and rack mount kits are all ordered separately.

BASIC UNIT

DXC-100-MN
Basic unit includes 6U high modular optional redundant DACS rack, 19-inch flush rack-mount kit;
no system or PS modules.

POWER SUPPLY MODULES

DXC-100-PS/AC
6U high, 100 to 240 VAC power supply module

DXC-100-PS/48
6U high, –48 VDC power supply module

SYSTEM MODULES

DXC-100-SMC.2-?
System manager controller

DXC-100M-XNM-M
Node manager for Nest 1 only

DXC-100M-XCC-?
Expansion cross-connect module for Nest 1 only

DXC-100M-XLC-M
Expansion link controller module, for Nests 2 to 8 only

Legend

? Module type (default is main and interface module set):
- **M** main, front-mounted module
- **IO** interface, rear-mounted module

I/O MODULES

See separate data sheets for details.

PROTECTION SWITCH REDUNDANT UNIT

DXC-100PSX-MN
3U high, N:1 redundancy system chassis with front-mounted fan and filter;
no power supplies, no system modules

DXC-100PSX-NC
3U high, nest controller module for DXC-100PSX, with DB-9 connector (only one required per chassis)

DXC-100PSX-PS/48
3U high, –48V DC power supply module for DXC-100PSX

NETWORK MANAGEMENT SYSTEMS

RV-PC-SW/TDM
RADview PC for TDM applications

RV-HP-SW/TDM
RADview HPOV for TDM applications

RV-LIC/DXC-100
RADview activation key for DXC-100

SUPPLIED ACCESSORIES

RM-DXC-100/19/CNTR
19-inch rack-mount kit, center mount

RM-DXC100PSX/19
19-inch rack mount kit for DXC-100PSX (one flush kit supplied with the unit)

CBL-100PSX-DNC
DXC-100PSX nest controller module cable, 50 cm (20 in), DB-9 (male) to DB-9 (male) (one cable supplied with the DXC-100PSX-NC module)

CBL-DXC-100-ALARM
DSMC.2 interface DB-9 to X.25 alarm cable (one cable supplied with the DSMC.2 module)

AC power cord (when AC power supply is ordered)

DC adapter plug (when DC power supply is ordered)

OPTIONAL ACCESSORIES

CBL-DXLC/3
DXLC to DXCC cable, 4 twisted pairs, 3m (10 ft) long

CBL-DXLC/6
DXLC to DXCC cable, 4 twisted pairs, 6m (20 ft) long

RM-DXC-100/23/#
23-inch rack mount kit for DXC-100

RM-DXC-100PSX/23/#
23-inch rack mount kit for DXC-100PSX

Legend

\# Rack mount placement:
- **CNTR** Center mounting
- **FLUSH** Flush mounting

International Headquarters
24 Raoul Wallenberg Street
Tel Aviv 69719, Israel
Tel. 972-3-6458181
Fax 972-3-6498250, 6474436
E-mail market@rad.com

North America Headquarters
900 Corporate Drive
Mahwah, NJ 07430, USA
Tel. 201-5291100
Toll free 1-800-4447234
Fax 201-5295777
E-mail market@radusa.com

www.rad.com

RAD data communications
The Access Company