

Transaction Integrator CICS TCP/IP Connectivity Installation Guide



attachmate[®]

Verastream[®] Transaction Integrator

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This guide provides the system requirements and installation instructions for the TCP/IP Connectivity Feature of the Attachmate® Verastream™ Transaction Integrator®.

System Requirements

You need the following to install the TCP/IP Connectivity Feature:

- SMP/E Release 8 or later
- CICS Transaction Server for OS/390® version 1, release 3 (CICS TS 1.3)
- TCP/IP Stack configured and running on OS/390
- Installer user ID authorized for CEDA Resource Definition Online

Note: Transaction Integrator supports only CICS applications that are capable of DPL invocation.

Transaction Integrator provides the mid-tier server functionality required to power the TCP/IP Connectivity Feature described in this guide.

Installing the Connectivity Feature

To install the TCP/IP Connectivity Feature from CD on an OS/390 server

1. From the CICS_TCPIP_CONNECTIVITY directory on the installation CD, upload the following binaries to your OS/390 server (HLQ=High Level Qualifier):

Upload this binary	To
ATTMF.KX51120.F1	ATTMF.TX51120.F1
ATTMF.KX51120.F2	ATTMF.TX51120.F2
ATTMF.KX51120.F3	ATTMF.TX51120.F3
ATTMF.KX51120.F4	ATTMF.TX51120.F4
ATTMF.KX51120.SMPMCS	ATTMF.TX51120.SMPMCS

2. Upload the text file `CD_DRIVECSCTCP\RECVPROD` to your OS/390 server at `YourHLQ.ATTM.JCL(RECVPROD)`.

This text file contains JCL that allocates files in refile format on SYSDA and then does the RECEIVES (not to be confused with the SMP/E RECEIVE) from the uploaded binaries into the appropriate refiles.

3. In `YourHLQ.ATTM.JCL(RECVPROD)`, follow the instructions in the member, modifying as per your local qualifiers, then save and submit the job:

```
//RECVPROD JOB (BATCH), BLDSMP1.SMPEUSER,
//MSGCLASS=X,NOTIFY=&SYSUID,
//REGION=6M,TIME=1439
//*
//*** BUILD PRODUCT ON DISK IN RELFILE FORMAT
//*****
//* PRIOR TO SUBMITTING, CHANGE THE FOLLOWING:
//*
//*****
//* JOB CARD: TO MEET YOUR INSTALLATION STANDARDS
//* GLOBAL CHANGE &PRDVOL TO THE SMP DATASET DASD VOLUME
//*
```

4. Upload the text file `CD_DRIVECSCTCP\CICSDEFS` to your OS/390 server at `YourHLQ.ATTM.JCL(CICSDEFS)` using a text style upload and append carriage return and line feed characters (CRLF) during the file transfer.

This text file contains JCL that defines required CICS resources within the target CICS region. This file will be used if a batch definition process is preferred to CICS resource definition online via the CEDA transaction during the system definition process described later in this manual.

5. In `YourHLQ.ATTM.JCL(CICSDEFS)`, follow the instructions in the member, modifying as per your local qualifiers, save and submit the job.

To customize your installation, “Customizing the CWI Analyzer Module.”

To install the Connectivity Feature disk on an OS/390 server

1. Update and run the following JCL to unload jobs to start the installation process:

```
//jobname JOB (account),
//STEP1 EXEC PGM PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//INDD DD DSN=ATTMF.KX51120.F2,
// UNIT=tape, Supply tape device name...
// * UNIT=SYSDA, Else disk device name
// DISP=OLD,
// VOL=SER=volser, Supply installation tape
// volser...
// * VOL=SER=diskname, Else supply installation
// * diskname
// LABEL=(3,SL)
//OUTDD DD DSN=your.install.lib,
// UNIT=sysda, Supply DASD device name
// DISP=(,CATLG),
// SPACE=(TRK,(10,5,5)),
// VOL=SER=volser Supply DASD volser if
// * desired
//SYSIN DD *
COPY INDD=INDD,OUTDD=OUTDD
S M=XT5SMPBL,XT5RECV,XT5APPLY,XT5UANLZ,XT5USRVR,XT5ACCP
//
```

2. Build the SMP/E environment by updating the restored XT5SMPBL member, and follow the change specifications at the beginning of the member, then save and submit the job:

```

//jobname JOB (account),
//*
//*****
//*
//* THIS JOB WILL ALLOCATE SMP/E DATASETS, DEFINE AND
//* INITIALIZE THE CSI, DEFINE GLOBAL, TARGET, AND DLIB
//* ZONES WITHIN THE SAME PHYSICAL VSAM DATASET
//*
//* PRIOR TO SUBMITTING, CHANGE THE FOLLOWING:
//*
//*****
//* JOB CARD: TO MEET YOUR INSTALLATION STANDARDS
//* GLOBAL CHANGE &SMQ TO THE HIGH LEVEL INDEX OF THE
//* SMP DATASETS
//* GLOBAL CHANGE &HLQ TO THE HIGH LEVEL INDEX OF THE
//* PRODUCT DATASETS
//* GLOBAL CHANGE &SYSDA TO THE UNIT NAME FOR DASD
//* DEVICES
//* GLOBAL CHANGE &SMPVOL TO THE SMP DATASET DASD
//* VOLUME
//* GLOBAL CHANGE &DFHLOD TO THE CICS SDFHLOAD LIB WITH
//* DFHERIO AND DFHEI1

```

3. To receive the product, update the restored XT5RECV member, follow the change specifications at the beginning of the member, then save and submit the job:

```

//jobname JOB (account),
//*
//*****
//*
//*RECEIVE PRODUCT
//*
//*PRIOR TO SUBMITTING, CHANGE THE FOLLOWING:
//*
//*****
//*JOB CARD: TO MEET YOUR INSTALLATION STANDARDS
//*GLOBAL CHANGE &SMQ TO THE HIGH LEVEL INDEX OF THE
//* SMP DATASETS
//*GLOBAL CHANGE &TAPE TO THE UNIT NAME FOR 34XX TAPE
//* DEVICES OR SYSDA IF INSTALLING
//* FROM DISK
//*GLOBAL CHANGE &TAPVOL TO THE INSTALLATION TAPE
//* VOLUME SERIAL OR TO DISK VOLUME
//* IF INSTALLING FROM DISK
//*UNCOMMENT AND USE THE SMPPTFIN DD STATEMENT THAT
//*CORRESPONDS TO THE INSTALL MEDIUM YOU USED,
//*TAPE OR DISK. SEE COMMENTS BELOW

```

4. Apply the product by uploading the restored XT5APPLY member, follow the change specifications at the beginning of the member, then save and submit the job:

```
//jobname JOB (account),
//*
//*****
//*
//*APPLY PRODUCT
//*
//*PRIOR TO SUBMITTING, CHANGE THE FOLLOWING:
//*
//*****
//*JOB CARD: TO MEET YOUR INSTALLATION STANDARDS
//*GLOBAL CHANGE &SMQ TO THE HIGH LEVEL INDEX OF THE
//*                               SMP DATASETS
```

This job ends with a condition code of 0. Message GIM32913I with a return code of 4 from link edit processing to the SMPLTS is normal and may be ignored.

Note: Make sure the loadlib to which the CICS modules are loaded is in the CICS loadlib concatenation. See your CICS DD DFHRPL.

5. Accept the product by updating the restored XT5ACCPT member, follow the change specifications at the beginning of the member, then save and submit the job:

```
//jobname JOB (account),
//*
//*****
//*
//*ACCEPT PRODUCT
//*
//*PRIOR TO SUBMITTING, CHANGE THE FOLLOWING:
//*
//*****
//*JOB CARD: TO MEET YOUR INSTALLATION STANDARDS
//*GLOBAL CHANGE &SMQ TO THE HIGH LEVEL INDEX OF THE
//*                               SMP DATASETS
```

6. Customize the Analyzer Control Template using the XTR5S001 macro embedded in the restored XT5UANLZ member. For specific information on how to use the XTR5S001 macro, refer to “Customizing the CWI Analyzer Module”.
7. Update CICS Web Interface Analyzer installation options by updating the XT5UANLZ member, follow the change specifications at the beginning of the member, then save and submit the job.
8. Customize the Server Control Template (SCT) using the XTR5S003 macro embedded in the restored XT5USVR member. For specific information on how to use the XTR5S003 macro, refer to “Customizing the CWI Server Module”.
9. Update CICS Server installation options by updating the XT5USVR member, follow the change specifications at the beginning of the member, then save and submit the job.

Note: To modify options from a previous APPLY, uncomment the REDO parameter. On the APPLY statement, modify the provided REWORK parameter to a larger number than that used on the prior APPLY, then save and resubmit the job

Customizing the CWI Analyzer Module

Because macro customization is an S/390® Assembly process, macro specifications adhere to the conventions of a standard S/390 Assembler specification:

- Names start in column one and have no more than eight characters
- XTR5S001 starts in column 10
- If a line is to be continued, it must end in a comma, and contain an “X” in column 72, and the continued portion must start on the next line in column 16
- The last line of the macro must *not* end in a comma

XTR5S001

The Analyzer Control template is customized using the XTR5S001 macro.

Syntax

```
XTR5S001 TYPE= < ANALYZER | IPPOOL | URIDEF | FINAL >
```

Parameters

Name	Description
ANALYZER	Begin definition for the Attachmate Analyzer. An Analyzer is defined by a single TYPE=ANALYZER macro, followed by one or more TYPE=IPPOOL and TYPE=XMLDEF macros. The specification is completed with a single TYPE=FINAL macro.
IPPOOL	Optional definition of a set of IP addresses or ranges that will be defined once and referenced in the definitions of one or more HTTP message handlers as defined using the URIDEF macro. This provides flexibility by allowing authorized IP addresses to be entered on each specific URIDEF macro, or defined once in a pool and referenced by use of the IPPOOL= parameter of the URIDEF macro.
URIDEF	Define a handler for a given HTTP based message that, when received over a CWI HTTP connection, will be directed to the specified CWI Converter and subsequently to the CWI-compliant server that will handle the request.

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Parameters (*continued*)

Name	Description
FINAL	Construct the Analyzer Control Template (ACT). This template is linked to the CWI Analyzer provided by Attachmate. IP addresses and pools will be resolved and efficient IP filtering will be linked into the CWI analyzer along with the specifications for each defined HTTP message and an indication of the default handler (if any) for undefined messages received. The Analyzer is assigned the designated TCP/IP port using the standard CEDA TCPIP SERVICE customization. (See the IBM® <i>CICS Resource Definition Guide</i> for further information.)

XTR5S001 TYPE=ANALYZER

Define a CWI Analyzer and an optional default analyzer to which unrecognized HTTP messages will be routed.

Syntax

```

XTR5S001  TYPE=ANALYZER,                                X
          DEFAULT= < Name | NONE >
          TIMEOUT= <Seconds>                             X
          CTRAN=   <NAME>
    
```

Parameters

Name	Description
ANALYZER	Begin definition for the Attachmate Analyzer. An Analyzer is defined by a single TYPE=ANALYZER macro.
DEFAULT Name	The CWI Analyzer program load module to be given control in the event that an HTTP message received does not contain a URI that is recognized as being controlled by this Analyzer. An example might be HTML received that should be routed to the IBM default HTML handler (DFHWBADX) to be processed by the default Web service provided by IBM. This designation allows HTML, XML, and undefined HTTP messages received over a given TCP/IP port to be shared between Attachmate-provided CWI components and CWI components provided by another vendor or customer.
NONE	Treats any HTTP message not specifically defined in TYPE=URIDEF macros as Invalid Requests.
TIMEOUT	Time in seconds that a Connect will be allowed to persist before its host resources are released. Once traffic beyond the Connect request is received, the timeout value configured for the Server will assume control for the session.
CTRAN	The transaction ID to be dispatched once the inactivity TIMEOUT for the session is reached. Transaction Integrator TCP/IP Connectivity Feature is shipped with a template value for CTRAN of AQCC.

XTR5S001 TYPE=IPPOOL

Define a Group of IP addresses for authorization to conduct HTTP message exchanges with the target CICS region.

Syntax

```
Name      XTR5S001 TYPE=IPPOOL,           X
          nnn.nnn.nnn.* ,             X
          nn.nnn.nnn.nnn,             X
          nn.nn.nnn.*
```

Parameters

Name	Description
POOLNAME Name	An eight-character name given to this group of IP addresses. Subsequent definitions of HTTP messages (URIDEF) will refer back to this name as the collection of IP addresses to be granted access via the defined HTTP message.
IP ADDRESSES <i>nnn.nnn.nnn.nnn</i>	A list (up to 16,000 elements) of IP addresses. Each IP address must consist of four components, each of which is either an integer less than 255 or the wildcard character (*). DNS names cannot be used.

XTR5S001 TYPE=URIDEF

Define an URI that designates a unique HTTP message handler, and the corresponding CWI Converter and server designated to process messages targeted for this URI.

Syntax

```
Name      XTR5S001 Type=URIDEF,           X
          URI=/MYURI/MYCOMPONENT,       X
          CWICONV=MYPROG,                X
          CWISERV=MYSERV,                X
          IPPOOL=poolname,               X
          |
          nn.nnn.nnn.nnn,                X
          nn.nn.nnn.*
```

Parameters

Name	Description
URI NAME Name	The eight-character name given to this HTTP message definition. By naming this URIDEF an implied IPPool is instantiated and can be referenced on subsequent URIDEF macros thereby simplifying definitions for IP filtering.
URI URI-Specification	A Universal Resource Indicator defining the CWI Converter and Server designated to handle the associated HTTP message. Note: The URI for Transaction Integrator is /ATTACHMATE/HAPICICS for a global DPL definition and/or /ATTACHMATE/HAPICICS/<programe> for each specific <program> to which IP access is to be controlled.
CWICONV converter	The eight-character name of the CWI server program load module to be given control when this defined HTTP message is received in the CICS region. The converter name must be supplied for non-Attachmate HTTP messages.
CWISERV server	The eight-character name of the CWI converter program load module to be given control when this defined HTTP message is received in the CICS region. The server name must be supplied for non-Attachmate HTTP messages
IP ADDRESSES <i>nnn.nnn.nnn.nnn</i>	A list of IP addresses (up to 16,000 elements.) DNS names cannot be used.

XTR5S001 TYPE=FINAL

Specify the conclusion of customization to the Attachmate CWI Analyzer.

Syntax

```
Name      XTR5S001  TYPE=FINAL
```

Transaction Integrator Shared Analyzer Example

The following example demonstrates how to access /ATTACHMATE/HAPICICS/PROGNAMA from *any* workstation, and how to access /ATTACHMATE/HAPICICS/PROGNAMB using 140.147.249.6 or 140.147.249.7, as well as any workstation starting with 63.71.228.

The group of IP addresses defined as accessible to /ATTACHMATE/HAPICICS/PROGNAMC is allowed access to /cgi-bin/ATTMHPS. The reference /cgi-bin/ATTMHPS routes requests to the Attachmate Transaction Integrator, illustrating the ability to share a given TCP/IP port with more than one product via the routing functionality provided by the Attachmate CWI Analyzer.

```
*-----
*           IN THE FOLLOWING CONFIGURATION EXAMPLE
*           140.147.249.7 = AUTHORIZED SPECIFIC CLIENT EXAMPLE
*           63.71.228.*   = AUTHORIZED IP SEGMENT EXAMPLE
*-----
XTR5S001 TYPE=ANALYZER,                                X
          DEFAULT=DFHWBADX,   Next in chain default analyzer X
          TIMEOUT=60, Connect will reserve a session for 1 min X
          CTRAN=AQCC   Clean up transaction ID for our server
MYPOOL  XTR5S001 TYPE=IPPOOL,                            X
          140.147.249.7,                                  X
          63.71.228.*
XTR5S001 TYPE=URIDEF,URI=/ATTACHMATE/HAPICICS,          X
          63.71.228.*
XTR5S001 TYPE=URIDEF,URI=/ATTACHMATE/HAPICICS/PROGNAMA, X
          *.*.*.*
ADJUSTR XTR5S001 TYPE=URIDEF,URI=/ATTACHMATE/HAPICICS/PROGNAMB, X
          140.147.249.7,                                  X
          140.147.249.6,                                  X
          63.71.228.*
XTR5S001 TYPE=URIDEF,URI=/ATTACHMATE/HAPICICS/PROGNAMC, X
          140.147.249.7
S3270  XTR5S001 TYPE=URIDEF,URI=/cgi-bin/ATTMHPS,        X
          IPPOOL=ADJUSTR
XTR5S001 TYPE=URIDEF,URI=/MYURI/MYCOMPONENT,            X
          CWICONV=MYCONV,                                  X
          CWISERV=MYSERV,                                  X
          IPPOOL=MYPOOL
XTR5S001 TYPE=FINAL
END
```

Customizing the CWI Server Module

XTR5S003

Use the XTR5S003 macro to customize the Server Control Template (SCT).

Syntax

```
XTR5S003 TIMEOUT= < seconds until timeout-session-cleanup>, X
          CTRAN=   < cleanup-transaction-id >, X
          VPASS=   < include SAF authentication >, X
          CPASS=   < include SAF password-changes >, X
          DPLS=   < include support for TCP CICS CONNECTOR>, X
          SYSID   < allow DPL to MRO attached CICS systems>, X
          FCBM    < allow access CICS memory for debugging>
```

Parameters

Name	Description
TIMEOUT <i>nnnn</i>	Number of seconds after which the session control blocks will be freed. This timeout-cleanup applies to all traffic except DPLS (Distributed-Program-Link-Sideband). DPLS is sessionless and stateless, therefore no control blocks persist that need to be freed.
CTRAN <i>tran</i>	A four-character transaction identification to be used to dispatch the timeout-session-cleanup. Attachmate recommends "AQCC" but any available transaction ID can be configured.
VPASS NO YES	Extended API support allowing client applications to interface with the Secondary-Authentication Facility (SAF); for example, RACF running on the host to authenticate client requesters. This parameter is reserved for future use and defaults to "NO." Transaction Integrator TCP/IP feature traffic interacts with SAF during DPL allowing only authorized users access to host programs without need for an auxiliary API.

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Parameters (continued)

Name	Description
CPASS NO YES	Extended API support allowing client applications to interface with the Secondary-Authentication Facility (SAF); for example, RACF running on the host thus allowing an authorized user to change the password for a given user. This parameter is reserved for future use and defaults to "NO."
DPLS YES NO	Configure host-based component to allow sideband (sessionless) Distributed-Program-Link to call a CICS application program. This is the mechanism that the Transaction Integrator uses when making a DPL call over a configured TCP/IP link. This parameter must be set to "YES" to allow Transaction Integrator to make non-SNA based links to host programs residing on CICS TS v. 1.3 or later systems.
SYSID NO YES	Extended API support allowing client applications to DPL via the CICS region running the Attachmate CWI that accepts the initial HTTP based request to programs that reside on Multi Region Operation (MRO) connected systems as configured by the local systems programming staff. This parameter is reserved for future use and defaults to "NO."
FCBM NO YES	Extended API support allowing client applications to debug control blocks used by the TCP/IP feature. This support is intended to be a diagnostic aid for use by Attachmate or customer personnel with advanced knowledge of CICS internal architecture. This parameter is reserved for future use and defaults to "NO."

Transaction Integrator Server Example

The following example shows a typical application configuration for a given CICS region. Configure any unused session memory to be timeout-purged after 10 minutes of inactivity.

```
*-----*
*          CONFIGURATION MACRO DEFINITION FOR XTR5S003          *
*                                                                 *
* - CONFIGURE SESSION INACTIVITY TIMEOUT FOR AMOUNT OF TIME THE *
*   SESSION STATE WILL BE MAINTAINED WHILE INACTIVE, IN SECONDS.*
*-----*
XTR5S003 TIMEOUT=600, DEFAULT SESSION TIMEOUT VAL IN SECONDS X
          CTRAN=AQCC,   DEFAULT CLEANUP TRANSACTION          X
          DPLS=YES     ALLOW SMART CONNECTOR TCP based DPL
END
```

System Definitions

Note: All system definitions are required unless a particular definition is specifically noted to be optional.

Remember to add the name selected for the &CICSDEF parameter to the list of groups auto-installed during CICS initialization.

Online Definition

To use online resource definition, define the CICS resources using the CEDA transaction and specify the definition parameters described in the tables below.

CICS Application Program definitions are required for the following programs that make up the TCP/IP connectivity component of the Transaction Integrator.

Batch Process

You can use a batch process for creating CICS system definitions on the target system: upload the JCL text file CICSDEFS from the CSCTCP directory of the product CD, follow the change specifications at the beginning of the member, then save and submit the job:

```
// jobname JOB (account)
/** CREATE CICS DEFINITIONS FOR
/** ATTACHMATE SMART CONNECTOR FOR CICS®
/** TCP/IP CONNECTIVITY FEATURE
/**
/**
/** JOB CARD: TO MEET YOUR INSTALLATION STANDARDS
/** GLOBAL CHANGE &CICSLOAD
/** to the prefix of the LOADLIB containing
/** DFHCSDUP
/** GLOBAL CHANGE &CICSREG
/** to the prefix to the CSD for the target region
/** GLOBAL CHANGE &PORT
/** to the desired TCP port for client access
/** Note that Attachmate recommends and has
/** reserved port 2317.
/** GLOBAL CHANGE &TRAN
/** to the desired clean up transaction
/** Note that Attachmate recommends AQCC as the
/** Clean up Transaction ID.
/** The value of the Clean up transaction must match the
/** CTRAN values used in the configuration macros for
/** the Analyzer (XTR5S000) and the Server (XTR5S002).
/** GLOBAL CHANGE &CICSDEF
/** to the desired RDO group name.
```

CICS Resource Definition Tables

Program	Language	Data Location	Execution Key	Description
XTR5A000	Assembler	Any	CICS	Interface Analyzer
XTR5A001	Assembler	Any	CICS	Interface Converter
XTR5A002	Assembler	Any	CICS	Interface Server

The TCP/IP feature of the Transaction Integrator uses the Attachmate CICS Web Interface Analyzer to receive HTTP-based input over a defined TCP/IP port on the mainframe. It analyzes the URI from the HTTP header and forwards the request along, or it invokes a registered CWI Converter program, such as the converter included in this product, and ultimately forwards the input packet to a server program capable of providing the desired function. The specific CWI Converter and server invoked in response to traffic via a given URI are specified in the XTR5S000 macro.

The Attachmate CWI Analyzer is also capable of filtering out requests from clients and letting only selected clients to exchange HTTP packets with their CICS counterparts. This IP filtering can allow specific IP addresses, IP addresses containing wildcard range designations, or any (all wildcard specifications) client IP address access to the host, depending upon the configuration of the Attachmate CWI Analyzer using the XTR5S000 macro.

Timeout values and cleanup transaction IDs to be invoked in the event of a Transaction Integrator "Connect" with no further requests within the timeout period can also be configured.

To customize the Attachmate CWI Analyzer load module you can specify:

- A default CWI Analyzer to be called in the event the Universal Resource Indicator (URI) in a received HTTP request is unrecognized
- Specific HTTP messages to be processed based upon their URI specification
- CWI Converter module name to handle HTTP requests associated with this URI
- A server module name to handle HTTP requests associated with this URI
- IP addresses that are authorized to exchange HTTP messages carrying a given URI with the target CICS region

A set of IP addresses can be specified with or without wildcard specifications, and these specifications can be attached to specific HTTP message traffic based upon the target URI specification contained in the HTTP packet. Alternately, an IP "pool" can be set up and referenced by multiple URI Analyzer definitions with each definition specifying its own converter and server program to handle the HTTP traffic. (For more details, see "Customizing the CWI Analyzer Module".)

A CICS transaction identification must be created for the server program. The name selected must match the cleanup transaction identified in the CTRAN parameter of both the Analyzer and the Server. See the CTRAN parameter as defined for XTR5S001 TYPE=ANALYZER in "Customizing the CWI Analyzer Module," and for XTR5S003 in "Customizing the CWI Server Module." The actual CICS transaction resource definition should be:

Transaction	Taskdata Location	Execution Key	Description
AQCC	Any	USER	CICS Task timeout-cleanup

The TCP/IP Service must be defined to allow connection from the local Transaction Integrator via a TCP port (in this example 2317) as follows:

Group	URM	Port Number	Transaction	Status/ Socketclose
XTR5CICS	XTR5A00 0	2317	CWXN	Open No

Make sure the CICS transactions CWXN and CWBA have the appropriate resource level setting:

TRANSACTIONS CWXN and CWBA

```

SECURITY
RESec      : No          No | Yes
CMDsec     : No          No | Yes
Extsec     : No          No | Yes
TRANSec    : 01          1-64
RS1        : 00          0-24 | Public
    
```

Note: CWXN, CWBA, and AQCC must have maximum tasks set to the highest number of anticipated concurrent tasks.
