

# Local Template-Based ATM PVC Provisioning

The Local Template-Based ATM Provisioning feature enables ATM permanent virtual circuits (PVCs) to be provisioned automatically as needed from a local configuration. ATM PVC autoprovisioning can be configured on a PVC, an ATM PVC range, or a VC class. If a VC class configured with ATM PVC autoprovisioning is assigned to an interface, all the PVCs on that interface will be autoprovisioned; this configuration is sometimes referred to as an *infinite range*.


- Restrictions for Local Template-Based ATM Provisioning, on page 1
- Information About Local Template-Based ATM Provisioning, on page 1
- How to Configure Local Template-Based ATM Provisioning, on page 2
- Configuration Examples for Local Template-Based ATM Provisioning, on page 9
- Feature Information for Local Template-Based ATM PVC Provisioning, on page 10


## Restrictions for Local Template-Based ATM Provisioning

The number of PVCs that can be established on an interface that is configured as an infinite range is limited to the maximum number of VCs that the platform can support.

## Information About Local Template-Based ATM Provisioning

Autoprovisioned ATM PVCs are not created until there is activity on the virtual path identifier (VPI)/virtual channel identifier (VCI) pair. When the interface is disabled and reenabled using the **shutdown** and **no shutdown** commands, autoprovisioned PVCs that are part of a PVC range or infinite range are removed upon shutdown and are not reestablished until the first incoming packet triggers PVC creation. During router reload, autoprovisioned PVCs are created when there is activity on the connection.

The total number of VCs that can be configured on an ATM port adapter is limited by the capacity of the port adapter. In cases of ATM link oversubscription, where a PVC range or infinite range is configured to provision more PVCs than the port adapter allows, the PVCs can be configured with a timeout so that they can be dynamically brought down as needed. When the timeout expires, the idle PVCs are removed, allowing the PVC range or infinite range of PVCs to share system resources.

ATM PVC local autoprovisioning supports the following applications: PPP over ATM, ATM routed bridge encapsulation, and routed RFC 1483.

The Local Template-Based ATM Provisioning feature enables ATM PVCs to be created automatically as needed from a local configuration, making the provisioning of large numbers of digital subscriber line (DSL) subscribers easier, faster, and less prone to error.

# How to Configure Local Template-Based ATM Provisioning

## Configuring ATM PVC Local Autoprovisioning in a VC Class

A VC class configured with ATM PVC autoprovisioning can be assigned to an ATM interface, an ATM PVC, an ATM PVC range, and an ATM PVC with a range.

**Note** If a VC class that is configured with ATM PVC autoprovisioning is assigned to an ATM interface, all PVCs on the interface will be autoprovisioned.

To enable ATM PVC local autoprovisioning in a VC class, use the following commands.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **vc-class atm** *vc-class-name*
4. **create on-demand**
5. **idle-timeout** *seconds* [*minimum-rate*]
6. **end**

### DETAILED STEPS

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **configure terminal**<br>**Example:**<br>`Router# configure terminal` | Enters global configuration mode. |
| **Step 3** | **vc-class atm** *vc-class-name*<br>**Example:**<br>`Router(config)# vc-class atm auto-pppoe` | Creates a VC class for an ATM PVC, SVC, or ATM interface and enters ATM VC class configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 4** | **create on-demand**<br>**Example:**<br>`Router(config-vc-class)# create on-demand` | Configures ATM PVC autoprovisioning, which enables a PVC or range of PVCs to be created automatically on demand. |
| **Step 5** | **idle-timeout** *seconds* [*minimum-rate*]<br>**Example:**<br>`Router(config-vc-class)# idle-timeout 300 10` | (Optional) Configures the idle timeout parameter for tearing down ATM SVC connections or autoprovisioned ATM PVC connections. |
| **Step 6** | **end**<br>**Example:**<br>`Router(config-vc-class)# end` | (Optional) Exits the ATM VC class configuration mode and returns to privileged EXEC mode. |

# Configuring ATM PVC Local Autoprovisioning on a PVC

ATM PVC local autoprovisioning can also be configured on a PVC by assigning a VC class that has been configured with ATM PVC local autoprovisioning to the PVC.

To enable ATM PVC local autoprovisioning on a PVC, use the following commands.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** slot/subslot/port[.subinterface]
4. **atm autovc retry** *interval*
5. **pvc** [*name*] *vpi* / *vci*
6. **create on-demand**
7. **idle-timeout** *seconds* [*minimum-rate*]
8. **end**

### DETAILED STEPS

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **configure terminal**<br>**Example:** | Enters global configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| | `Router# configure terminal` | |
| **Step 3** | **interface atm** slot/subslot/port[.subinterface]<br>**Example:**<br>`Router(config)# interface atm5/0` | Configures an ATM interface. |
| **Step 4** | **atm autovc retry** *interval*<br>**Example:**<br>`Router(config-if)# atm autovc retry 60` | (Optional) Configures the interval at which the router will repeat the attempt to create autoprovisioned PVCs after a failure of the initial creation attempt. |
| **Step 5** | **pvc** [*name*] *vpi* / *vci*<br>**Example:**<br>`Router(config-if)# pvc 1/300` | Creates an ATM PVC and enters ATM virtual circuit configuration mode. |
| **Step 6** | **create on-demand**<br>**Example:**<br>`Router(config-if-atm-vc)# create on-demand` | Configures ATM PVC autoprovisioning, which enables a PVC or range of PVCs to be created automatically on demand. |
| **Step 7** | **idle-timeout** *seconds* [*minimum-rate*]<br>**Example:**<br>`Router(config-if-atm-vc)# idle-timeout 300 10` | (Optional) Configures the idle timeout parameter for tearing down ATM SVC connections or autoprovisioned ATM PVC connections. |
| **Step 8** | **end**<br>**Example:**<br>`Router(config-if-atm-vc)# end` | (Optional) Exits the ATM virtual circuit configuration mode and returns to privileged EXEC mode. |

# Configuring ATM PVC Local Autoprovisioning on an ATM PVC Range

ATM PVC local autoprovisioning can also be configured on a range by assigning a VC class that has been configured with ATM PVC local autoprovisioning to the range.

To enable ATM PVC autoprovisioning on an ATM PVC range, use the following commands.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** slot/subslot/port[**.** *subinterface*]
4. **atm autovc retry** *interval*
5. **range** [*range-name*] **pvc** *start-vpi* / *start-vci end-vpi* / *end-vci*
6. **create on-demand**

7. **idle-timeout** *seconds* [*minimum-rate*]
8. **end**

## DETAILED STEPS

### Procedure

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **configure terminal**<br>**Example:**<br>`Router# configure terminal` | Enters global configuration mode. |
| **Step 3** | **interface atm** slot/subslot/port[**.** *subinterface*]<br>**Example:**<br>`Router(config)# interface atm5/0` | Configures an ATM interface. |
| **Step 4** | **atm autovc retry** *interval*<br>**Example:**<br>`Router(config-if)# atm autovc retry 60` | (Optional) Configures the interval at which the router will repeat the attempt to create autoprovisioned PVCs after a failure of the initial creation attempt. |
| **Step 5** | **range** [*range-name*] **pvc** *start-vpi* / *start-vci end-vpi* / *end-vci*<br>**Example:**<br>`Router(config-if)# range auto pvc 0/100 1/200` | Defines a range of ATM PVCs and enters ATM PVC range configuration mode. |
| **Step 6** | **create on-demand**<br>**Example:**<br>`Router(config-if-atm-range)# create on-demand` | Configures ATM PVC autoprovisioning, which enables a PVC or range of PVCs to be created automatically on demand. |
| **Step 7** | **idle-timeout** *seconds* [*minimum-rate*]<br>**Example:**<br>`Router(config-if-atm-range)# idle-timeout 300 10` | (Optional) Configures the idle timeout parameter for tearing down ATM SVC connections or autoprovisioned ATM PVC connections. |
| **Step 8** | **end**<br>**Example:**<br>`Router(config-if-atm-range)# end` | (Optional) Exits the ATM PVC range configuration mode and returns to privileged EXEC mode. |

# Configuring ATM PVC Local Autoprovisioning on PVC Within a Range

ATM PVC local autoprovisioning can also be configured on a PVC within a range by assigning a VC class that has been configured with ATM PVC local autoprovisioning to the PVC.

To enable ATM PVC autoprovisioning on a PVC within an ATM PVC range, use the following commands.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** slot/subslot/port[**.** *subinterface*]
4. **atm autovc retry** *interval*
5. **range** [*range-name*] **pvc** *start-vpi* / *start-vci end-vpi* / *end-vci*
6. **pvc-in-range** [*pvc-name*] [*vpi* /]*vci*]
7. **create on-demand**
8. **idle-timeout** *seconds* [*minimum-rate*]
9. **end**

## DETAILED STEPS

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **configure terminal**<br>**Example:**<br>`Router# configure terminal` | Enters global configuration mode. |
| **Step 3** | **interface atm** slot/subslot/port[**.** *subinterface*]<br>**Example:**<br>`Router(config)# interface atm5/0` | Configures an ATM interface. |
| **Step 4** | **atm autovc retry** *interval*<br>**Example:**<br>`Router(config-if)# atm autovc retry 60` | (Optional) Configures the interval at which the router will repeat the attempt to create autoprovisioned PVCs after a failure of the initial creation attempt. |
| **Step 5** | **range** [*range-name*] **pvc** *start-vpi* / *start-vci end-vpi* / *end-vci*<br>**Example:** | Defines a range of ATM PVCs and enters ATM PVC range configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| | `Router(config-if)# range auto pvc 0/100 1/200` | |
| **Step 6** | **pvc-in-range** [*pvc-name*] [*vpi* /]*vci*]<br>**Example:**<br>`Router(config-if-atm-range)# pvc-in-range 0/101` | Defines an individual PVC within a PVC range and enables PVC-in-range configuration mode. |
| **Step 7** | **create on-demand**<br>**Example:**<br>`Router(config-if-atm-range-pvc)# create on-demands` | Configures ATM PVC autoprovisioning, which enables a PVC or range of PVCs to be created automatically on demand. |
| **Step 8** | **idle-timeout** *seconds* [*minimum-rate*]<br>**Example:**<br>`Router(config-if-atm-range-pvc)# idle-timeout 300 10` | (Optional) Configures the idle timeout parameter for tearing down ATM SVC connections or autoprovisioned ATM PVC connections. |
| **Step 9** | **end**<br>**Example:**<br>`Router(config-if-atm-range-pvc)# end` | (Optional) Exits the PVC-in-range configuration mode and returns to privileged EXEC mode. |

# Verifying ATM PVC Autoprovisioning

To verify that ATM PVC local autoprovisioning is configured and working correctly, perform the tasks in the following steps:

### SUMMARY STEPS

1. Enter the **show running-config** command to verify that the configuration is correct.
2. Enter the **show atm pvc** command. PVCs that have been autoprovisioned will have the value "PVC-A" ("A" stands for automatic) in the Type field.
3. Enter the **show atm pvc** command with the *vpi*/*vci* arguments to see if ATM PVC local autoprovisioning is configured on a specific PVC. If ATM PVC local autoprovisioning is configured, the text "VC Auto Creation Enabled: local" will appear in the output.

### DETAILED STEPS

**Procedure**

**Step 1** Enter the **show running-config** command to verify that the configuration is correct.

**Step 2** Enter the **show atm pvc** command. PVCs that have been autoprovisioned will have the value "PVC-A" ("A" stands for automatic) in the Type field.

**Example:**

```
Router# show atm pvc
            VCD /                                          Peak  Avg/Min Burst
Interface   Name       VPI   VCI  Type   Encaps   SC   Kbps   Kbps   Cells  Sts
5/0.1       117        0     50   PVC-A   SNAP    UBR  149760                UP
5/0.1       118        0     51   PVC-A   SNAP    UBR  149760                UP
5/0.1       119        0     52   PVC-A   SNAP    UBR  149760                UP
```

**Step 3** Enter the **show atm pvc** command with the *vpi*/*vci* arguments to see if ATM PVC local autoprovisioning is configured on a specific PVC. If ATM PVC local autoprovisioning is configured, the text "VC Auto Creation Enabled: local" will appear in the output.

**Example:**

```
Router# show atm pvc 0/51
ATM5/0.1: VCD: 118, VPI: 0, VCI: 51
UBR, PeakRate: 149760
AAL5-LLC/SNAP, etype:0x0, Flags: 0x20000C20, VCmode: 0x0
OAM frequency: 0 second(s), OAM retry frequency: 1 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Disabled
OAM VC state: Not Managed
ILMI VC state: Not Managed
InARP frequency: 15 minutes(s)
Transmit priority 4
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InPRoc: 0, OutPRoc: 0, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
InPktDrops: 0, OutPktDrops: 0
CrcErrors: 0, SarTimeOuts: 0, OverSizedSDUs: 0, LengthViolation: 0, CPIErrors: 0
Out CLP=1 Pkts: 0
OAM cells received: 0
F5 InEndloop: 0, F5 InSegloop: 0, F5 InAIS: 0, F5 InRDI: 0
F4 InEndloop: 0, F4 InSegloop: 0, F4 InAIS: 0, F4 InRDI: 0
OAM cells sent: 0
F5 OutEndloop: 0, F5 OutSegloop: 0, F5 OutRDI: 0
F4 OutEndloop: 0, F4 OutSegloop: 0, F4 OutRDI: 0
OAM cell drops: 0
Status: UP
PPP: Virtual-Access3 from Virtual-Template1
VC Auto Creation Enabled: local
```

# Monitoring and Maintaining ATM PVC Local Autoprovisioning

To monitor and maintain ATM PVC autoprovisioning, use one or more of the following commands.

## SUMMARY STEPS

1. **enable**
2. **debug atm autovc** {**event** | **error** | **all**}
3. **show atm pvc**
4. **show atm vc**

**DETAILED STEPS**

**Procedure**

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **debug atm autovc** {**event** \| **error** \| **all**}<br>**Example:**<br>`Router# debug atm autovc all` | Displays information about autoprovisioned ATM PVC events and errors. |
| **Step 3** | **show atm pvc**<br>**Example:**<br>`Router# show atm pvc` | Displays all ATM PVCs and traffic information. |
| **Step 4** | **show atm vc**<br>**Example:**<br>`Router# show atm vc` | Displays all ATM PVCs and SVCs and traffic information. |

# Configuration Examples for Local Template-Based ATM Provisioning

## ATM PVC Local Autoprovisioning on an ATM Interface Example

In the following example, local autoprovisioning is enabled on all PVCs on ATM interface 5/0:

```
vc-class atm auto-pppoe
 vbr-nrt 1000 100
 protocol pppoe
 create on-demand
 idle-timeout 300 10
!
interface atm 5/0
 class-int auto-pppoe
 atm autovc retry 10
```

## ATM PVC Local Autoprovisioning on a PVC Example

The following example shows the configuration of local autoprovisioning on a PVC:

```
interface atm 5/0
 pvc 1/300
  create on-demand
  idle-timeout 300 10
```

## ATM PVC Local Autoprovisioning on an ATM PVC Range Example

The following example shows the configuration of local autoprovisioning on an ATM PVC range called "auto":

```
interface atm 5/0
 range auto pvc 0/100 1/200
  create on-demand
```

## ATM PVC Local Autoprovisioning on a PVC Within a Range Example

The following example shows the configuration of local autoprovisioning on a PVC within a PVC range:

```
interface atm 5/0
 range auto pvc 0/100 1/200
  pvc-in-range 0/101
   create on-demand
```

# Feature Information for Local Template-Based ATM PVC Provisioning

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

***Table 1: Feature Information for Local Template-Based ATM PVC Provisioning***

| Feature Name | Releases | Feature Information |
|---|---|---|
| Local Template-Based ATM PVC Provisioning | Cisco IOS XE Release 2.5 | This feature was introduced on Cisco ASR 1000 Series Aggregation Services Routers.<br>The Local Template-Based ATM Provisioning feature enables ATM permanent virtual circuits (PVCs) to be provisioned automatically as needed from a local configuration.<br>The following commands were introduced or modified: **atm autovc retry, create on-demand, debug atm autovc, idle-timeout.** |