



Object Library

Anti-Passback Object

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ANTI-PASSBACK OBJECT

INTRODUCTION

The Anti-Passback object is used in monitoring and enforcing the use of entry and exit readers in accordance with the anti-passback rule by time, and the anti-passback rule by location (also known as the entry-exit rule).

Violations of any of the anti-passback rules can be reported to the P2000 server and may cause access to be denied for the entity who is violating the rules.

The anti-passback feature can also be used locally (without the P2000 server).

An anti-passback application managing a single anti-passback area consists of one or more Anti-Passback objects cooperating with one or more Access Control objects.

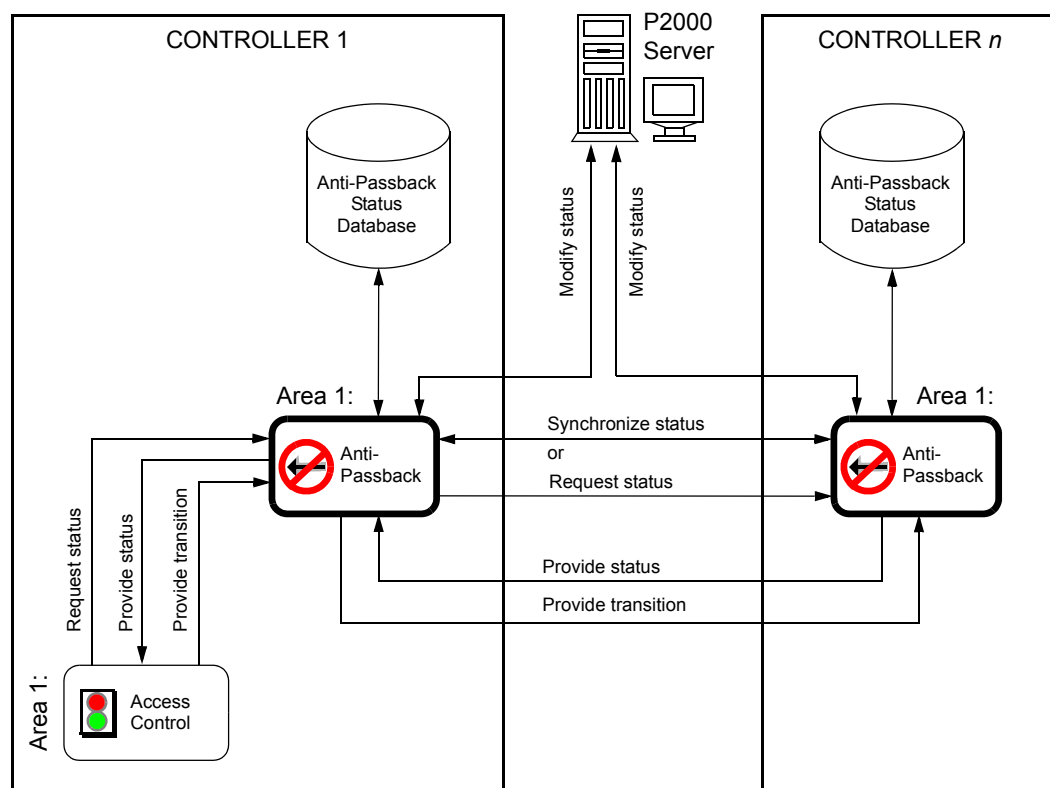


Figure 1: Anti-Passback Object

In the course of an access decision subject to any anti-passback rule, the Access Control object consults its local Anti-Passback object, which, depending on its configuration, may either return an access decision based on its local database, or request the decision from a remote Anti-Passback object.

The Access Control object also keeps its local Anti-Passback object informed about any transitions into or out of the area. Depending on its configuration, the Anti-Passback object may forward that information to remote Anti-Passback objects.

An entity adjusts its anti-passback status by always using the correct reader and transitioning at that reader following the access decision. An entity's anti-passback status can also be changed by intervention from the host, and the status for all entities can be reset by schedule or event.

ATTRIBUTES

This section describes visible attributes specific to the Anti-Passback object. This object also contains:

- Attributes common to all objects in the P2000 Security Management System. For details, see the *General Object Information* document.
- Internal attributes, which are invisible to the user and cannot be modified directly, but may be referred to throughout this document.

Table 1: Anti-Passback Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options /Range
<i>Anti-Passback Requirements</i>	3694	Enumeration	WCA	-	0 = Entry-Exit Status Only 1 = Elapsed Time Only 2 = Entry-Exit Status or Time Elapsed 3 = Entry-Exit Status and Time Elapsed
<i>Default Status</i>	3693	Enumeration	WCA	-	0 = Undefined 1 = In 2 = Out
<i>Entry Anti-Passback Time</i>	3695	Unsigned32	WCA	-	In seconds 0 - 31622400 (366 days)
<i>Exit Anti-Passback Time</i>	3696	Unsigned32	WCA	-	In seconds 0 - 31622400 (366 days)
<i>Fault Cause</i>	2896	Enumeration	F	-	0 = None 1 = Invalid Configuration 2 = Out Of Memory
<i>Mode</i>	961	Enumeration	F	-	0 = Local 1 = Shared 2 = Central 3 = Invalid

Table 1: Anti-Passback Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options /Range
<i>Notification Class</i>	17	Unsigned32	WCA	1	-
<i>Notify Priority</i>	3644	Unsigned8	WCA	-	-
<i>Notify Type</i>	72	Enumeration	-		Always Event (Refer to <i>BACnet Standard 12.19.20</i>)
<i>Peer 1 Object</i>	3698	Object reference	WCAN	-	-
<i>Peer 1 Status</i>	3678	Enumeration	F	-	0 = Unused 1 = Operational 2 = Not Operational 3 = Offline
<i>Peer 2 Object</i>	3699	Object reference	WCAN	-	-
<i>Peer 2 Status</i>	3679	Enumeration	F	-	0 = Unused 1 = Operational 2 = Not Operational 3 = Offline
<i>Peer 3 Object</i>	3700	Object reference	WCAN	-	-
<i>Peer 3 Status</i>	3680	Enumeration	F	-	0 = Unused 1 = Operational 2 = Not Operational 3 = Offline
<i>Present Value</i>	85	Enumeration	F	-	0 = Not Operational 1 = Operational 2 = Peer(s) Offline 3 = Star Center Offline
<i>Reset All Entry Times</i>	3691	Boolean	W	-	-
<i>Reset All Exit Times</i>	3692	Boolean	W	-	-
<i>Set All To Default Status</i>	3688	Boolean	W	-	-
<i>Star Center Object</i>	3697	Object reference	WCAN	-	-
<i>Star Center Status</i>	2903	Enumeration	F	-	0 = Unused 1 = Operational 2 = Not Operational 3 = Offline
<i>Transition Notification</i>	4297	Boolean	WCA	-	-

A - Archive, C - Configurable, F - PMI refreshing, N - Value not required, W - Writable

Anti-Passback Requirements – Specifies which aspects of the anti-passback rule are applicable. The options are:

- **Entry-Exit Status Only** - The anti-passback rule requires that entry requests are done by entities that are either “In” or “Undefined.” It also requires that exit requests are done by entities that are either “Out” or “Undefined.” This setting enables a typical entry-exit application with entry and exit readers.
- **Elapsed Time Only** - The anti-passback rule requires that entry requests are done by entities that have not had any entry transitions less time ago than specified in the *Entry Anti-Passback Time* attribute. It also requires that exit requests are done by entities that have not had any entry transitions less time ago than specified in the *Exit Anti-Passback Time* attribute. This setting enables a typical anti-passback by time application where only entry readers are available.
- **Entry-Exit Status or Time Elapsed** - The anti-passback rule requires that entry requests are done by entities that are either “In” or “Undefined,” or have not had any entry transitions less time ago than specified in the *Entry Anti-Passback Time* attribute. It also requires that exit requests are done by entities that are either “Out” or “Undefined,” or have not had any entry transitions less time ago than specified in the *Exit Anti-Passback Time* attribute.
- **Entry-Exit Status and Time Elapsed** - The anti-passback rule requires that entry requests are done by entities that are either “in” or “undefined,” and have not had any entry transitions less time ago than specified in the *Entry Anti-Passback Time* attribute. It also requires that exit requests are done by entities that are either “Out” or “Undefined,” and have not had any entry transitions less time ago than specified in the *Exit Anti-Passback Time* attribute.

Default Status - Specifies the entry-exit status that all entities have after the controller reboots, or after the *Set All To Default Status*, the *Reset All Entry Times* or the *Reset All Exit Times* attributes are written to “True.”

Entry Anti-Passback Time – Specifies the time in seconds following an entity’s entry transition that must elapse before the entity can make the next entry request without violating the anti-passback by time rule. If you do not want to use this feature, this attribute should be set to 0.

Exit Anti-Passback Time – Specifies the time in seconds following an entity’s exit transition that must elapse before the entity can make the next exit request without violating the anti-passback by time rule. If you do not want to use this feature, this attribute should be set to 0.

Fault Cause – Indicates the highest priority reason why the *Present Value* attribute is set to “Not Operational.” In case multiple reasons apply, the value with the higher enumeration value is given. The options are:

- **None** - The *Present Value* attribute is not set to “Not Operational.”
- **Invalid Configuration** - The *Mode* attribute indicates a state of “Invalid.”
- **Out Of Memory** - The controller does not have enough memory to store the anti-passback status of all entities.

Mode – Indicates the nature of the anti-passback application, as determined by the Anti-Passback object's configuration. The options are:

- Local - The *Star Center Object*, *Peer 1 Object* through *Peer 3 Object* attributes are all blank.
- Shared - The *Star Center Object* attribute is blank, and at least one of the *Peer 1 Object* through *Peer 3 Object* attributes is not blank.
- Central - The *Star Center Object* attribute is not blank, while the *Peer 1 Object* through *Peer 3 Object* attributes are blank.
- Invalid - The object has an invalid configuration, because the *Star Center Object* attribute and at least one of the *Peer 1 Object* through *Peer 3 Object* attributes are not blank.

Notification Class – Specifies which Security Notification Class object should be used by the Anti-Passback object to send its notifications.

Notify Priority – Specifies the Priority parameter of all notifications generated by the Anti-Passback object.

Notify Type – Specifies that all notifications generated by the Anti-Passback object are of type "Event."

Peer 1 Object – Specifies the Anti-Passback object that is the first peer for shared anti-passback mode.

Peer 1 Status – Indicates the state of the object referenced by the *Peer 1 Object* attribute. The options are:

- Unused - The *Peer 1 Object* attribute is blank.
- Operational - The referenced object is online and has a *Present Value* other than "Not operational."
- Not operational - The referenced object is online and has a *Present Value* of "Not Operational."
- Offline - The referenced object is offline.

Peer 2 Object – Specifies the Anti-Passback object that is the second peer for shared anti-passback mode.

Peer 2 Status – Indicates the state of the object referenced by the *Peer 2 Object* attribute. See the description of the *Peer 1 Object* attribute for details.

Peer 3 Object – Specifies the Anti-Passback object that is the third peer for shared anti-passback mode.

Peer 3 Status – Indicates the state of the object referenced by the *Peer 3 Object* attribute. See the description of the *Peer 1 Object* attribute for details.

Present Value – Indicates the general state of the Anti-Passback object. The options are:

- Not Operational - The objects starts up, has a problem, or is not supported by the controller.
- Operational - The objects works without any problems.
- Peer(s) Offline - The objects works in shared mode, but cannot inform one or more of its peers.
- Star Center Offline - The object works in central mode, but cannot reach the central Anti-Passback object.

Reset All Entry Times – When written to “True,” this attribute specifies that the entry time of all entities in the controller is reset, so they can make immediate entry requests again. This also sets the entry status of all entities in the controller to the value specified by the *Default Status* attribute. The value of this attribute remains always “False.” See “Setting the Anti-Passback Status” on page 11 for details.

Reset All Exit Times – When written to “True,” this attribute specifies that the exit time of all entities in the controller is reset, so they can make immediate exit requests again. This also sets the exit status of all entities in the controller to the value specified by the *Default Status* attribute. The value of this attribute remains always “False.” See “Setting the Anti-Passback Status” on page 11 for details.

Set All To Default Status – When written to “True,” this attribute specifies that the entry-exit status of all entities in the controller is set to the values specified by the *Default Status* attribute. This also resets the entry time and the exit time for all entities in the controller. The value of this attribute remains always “False.” See “Setting the Anti-Passback Status” on page 11 for details.

Star Center Object – Specifies the Anti-Passback object that is consulted and updated for central anti-passback mode.

Star Center Status – Indicates the state of the object referenced by the *Star Center Object* attribute. The options are:

- Unused - The *Star Center Object* attribute is blank.
- Operational - The referenced object is online and has a *Present Value* of “Operational.”
- Not Operational - The referenced object is online and has a *Present Value* other than “Operational.”
- Offline - The referenced object is offline.

Transition Notification – Specifies whether the Anti-Passback object shall generate a notification of category “Transition” every time one of the following conditions occurs:

- An entity transitions into or out of the area
- An entity has its status set to “Undefined”
- An entity has its entry or exit time reset

- All entities have their status set to the current default status
- All entities have their entry or exit times reset
- The Anti-Passback object starts up

The Transition Notification attribute should only be set to “True” when an application in the P2000 system is set up to make use of this notification.

COMMANDS

This section describes commands that can be issued to this object from SCT.

Table 2: Anti-Passback Object Commands

Command Name	Description
Set All To Default Status	Writes the <i>Set All To Default Status</i> attribute to “True.”
Reset All Entry Times	Writes the <i>Reset All Entry Times</i> attribute to “True.”
Reset All Exit Times	Writes the <i>Reset All Exit Times</i> attribute to “True.”
Change Attribute	See the description below.

The *Change Attribute* is a generic command available for writing the attributes of an object. It is mainly used to change an attribute value from those features which work only with commands. For the sole purpose of giving a generic example, there is no command defined to change the *Notify Priority* attribute of an object. *Change Attribute* could, therefore, be used to change the *Notify Priority* attribute through an interlock or multiple command, both features which require commands to be entered. The *Change Attribute* command requires two parameters:

- Attribute - This parameter specifies which attribute of the object is to be written. Only writable attributes may be changed by this command.
- New value - This parameter specifies new value to be written and must be the same data type as the attribute. The only data types allowed in this command are those allowed as command parameters. A command priority can be specified if the attribute to be changed is a prioritized attribute.

VIEWS

This section illustrates how the System Configuration Tool displays properties of the Anti-Passback object. This screen also allows you to set the values of configurable attributes. For more information refer to the *System Configuration Tool (SCT)* manual.

Attribute	Value
Object	
Name	C0002-00004-AP
Description	
Object Type	Anti-Passback
Object Category	General
Partition	Super User
Public	<input type="checkbox"/>
Engineering Values	
Anti-Passback Requirements	Entry-Exit Status Only
Entry Anti-Passback Time	0 seconds
Exit Anti-Passback Time	0 seconds
Default Status	Undefined
Star Center Object	Object Name:
	Reference:
Peer 1 Object	Object Name:
	Reference:
Peer 2 Object	Object Name:
	Reference:
Peer 3 Object	Object Name:
	Reference:
Notification	
Notification Class	1
Notify Priority	0
Transition Notification	<input type="checkbox"/>

Figure 2: Configuration View

DESCRIPTION OF OPERATION

Anti-Passback Area

An anti-passback application consists of one or more Anti-Passback objects co-operating with one or more Access Control objects. In cases where the anti-passback area spans multiple controllers, there must be exactly one Anti-Passback object on each controller assigned to that area. A single controller may run several independent anti-passback applications, or parts thereof.

The area controlled by a single anti-passback application does not have to be contiguous. For example, all parking structures of a facility may be grouped together in a single anti-passback area, although the structures are separate buildings. This ensures that no matter what parking structure a person enters, the anti-passback rules will apply to all structures.

Entry-Exit Status

With respect to a single area, an entity can only be in one of two states: “In” or “Out.”

The Anti-Passback object’s entry-exit status of an entity can be one of three states: “In,” “Out,” or “Undefined,” which means that the next entry request or the next exit request will not be denied based on the entity’s location.

From an off-box point of view (the viewpoint outside of the controller), the entry-exit status can appear as one of four states: “In,” “Out,” “Undefined,” or “Unknown,” which is used for all cases where the anti-passback status cannot be accessed.

If there is a discrepancy between the location where an entity is identified, and the location where the Anti-Passback object assumes that entity is, an entry-exit violation occurs. The result of this entry-exit check is returned to the object requesting entry or exit. There are several reasons why the assumed location of an entity may not match the entity’s actual location:

- The entity did not properly check into the area
- The entity did not properly check out of the area
- The entity’s entry-exit status was modified to an incorrect value by the operator
- The entity’s entry-exit status was reset to its default value after the controller rebooted
- The entry-exit status was not updated during offline periods in a distributed system

The Anti-Passback object does not differentiate why there is a discrepancy.

Anti-Passback Time

The Anti-Passback object tracks the most recent transition of each entity into and out of the anti-passback area. On each entry request, the time difference between the current time and the time of the last entry transition is computed. If this time is less than the value specified in the *Entry Anti-Passback Time* attribute, an anti-passback violation occurs.

On each exit request, the time difference between the current time and the time of the last exit transition is computed. If this time is less than the value specified in the *Exit Anti-Passback Time* attribute, an anti-passback violation occurs.

Requesting Entry

An object can request entry permission for an entity by writing that entity's ID to an Anti-Passback object's *Get Entity ID In* attribute.

The Anti-Passback object returns the Write Attribute service with one of the following error codes:

- OK - The entry request is granted.
- Deferred - The entry request is deferred to another Anti-Passback object.
- Denied (entry-exit violation) - The entry request is denied because the entity's entry-exit status is already in.
- Offline - The anti-passback status is on an offline device and cannot be obtained.
- Not operational - The anti-passback status is not accessible because of a not operational Anti-Passback object.
- Undefined status - The entity's anti-passback status is undefined.
- Unknown entity - The entity does not exist in the anti-passback status database.
- Denied (anti-passback violation) - The entry request is denied because the entity's last transition into the area was more recent than allowed by the Anti-Passback object.

If any other error code is returned, the Write Attribute service itself failed.

Requesting Exit

An object can request exit permission for an entity by writing that entity's ID to an Anti-Passback object's *Get Entity ID Out* attribute. The Anti-Passback object returns the Write Attribute service with one of the following error codes:

- OK - The exit request is granted.
- Deferred - The exit request is deferred to another Anti-Passback object.
- Denied (entry-exit violation) - The exit request is denied because the entity's entry-exit status is already out.
- Offline - The anti-passback status is on an offline device and cannot be obtained.
- Not operational - The anti-passback status is not accessible because of a not operational Anti-Passback object.
- Undefined status - The entity's anti-passback status is undefined.
- Unknown entity - The entity does not exist in the anti-passback status database.
- Denied (anti-passback violation) - The exit request is denied because the entity's last transition out of the area was more recent than allowed by the Anti-Passback object.

If any other error code is returned, the Write Attribute service itself failed.

Setting the Anti-Passback Status

An object can set the entry-exit status of an entity to "In" by writing that entity's ID to the *Set Entity ID In* attribute.

An object can set the entry-exit status of an entity to "Out" by writing that entity's ID to the *Set Entity ID Out* attribute.

An object can set the entry-exit status of an entity to "Undefined" by writing that entity's ID to the *Set Entity ID Undefined* attribute.

An object can reset the entry time of an entity by writing that entity's ID to the *Reset Entity ID Entry Time* attribute.

An object can reset the exit time of an entity by writing that entity's ID to the *Reset Entity ID Exit Time* attribute.

The Anti-Passback object returns the Write Attribute service with one of the following error codes:

- OK - The entity's anti-passback status was correctly updated.
- Deferred - The entity's anti-passback status update is deferred to another Anti-Passback object.
- Offline - The anti-passback status is on an offline device and cannot be updated.
- Not operational - The anti-passback status is not accessible because of a not operational Anti-Passback object.

If any other error code is returned, the Write Attribute service itself failed.

An object can set the entry-exit status of all entities to the value specified by the *Default Status* attribute by writing the *Set All To Default Status* attribute to "True." This also resets the entry time and the exit time for all entities in the controller.

An object can reset the entry time of all entities by writing the *Reset All Entry Times* attribute to "True." This also sets the entry status of all entities in the controller to the value specified by the *Default Status* attribute.

An object can reset the exit time of all entities by writing the *Reset All Exit Times* attribute to "True." This also sets the exit status of all entities in the controller to the value specified by the *Default Status* attribute.

The Anti-Passback object returns the Write Attribute service with one of the following error codes:

- OK - The entities' anti-passback status was correctly updated.
- Deferred - The entity's anti-passback status update is deferred to another Anti-Passback object.
- Offline - The anti-passback status is on an offline device and cannot be updated.
- Not operational - The anti-passback status is not accessible because of a not operational Anti-Passback object.

If any other error code is returned, the Write Attribute service itself failed.

Local Anti-Passback Application

The Anti-Passback object operates in local mode, when the *Peer 1 Object* through *Peer 3 Object* attributes and the *Star Center Object* attribute are blank. The entities' anti-passback times are exclusively stored in a local database.

Figure 3 shows a typical sequence of events in local anti-passback mode.

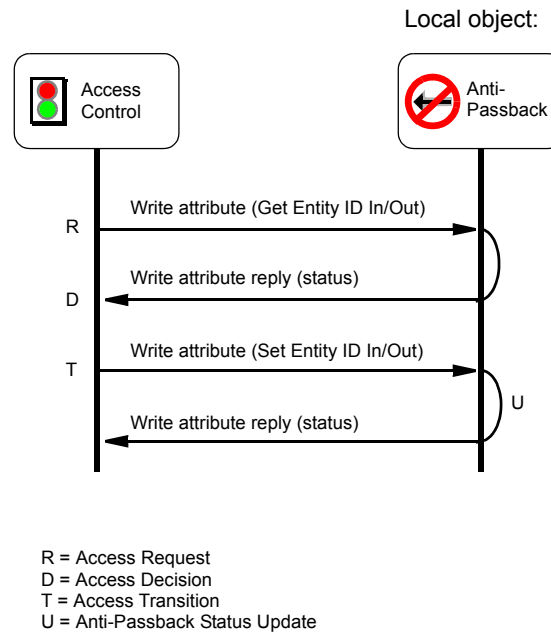


Figure 3: Local Anti-Passback Application

The write attribute reply status values for the *Get Entity ID* attributes is described in “Requesting Entry” on page 10 and “Requesting Exit” on page 11.

The write attribute reply status values for the *Set Entity ID* attributes is described in “Setting the Anti-Passback Status” on page 11.

Shared Anti-Passback Application

The Anti-Passback object operates in shared mode, when at least one of the *Peer 1 Object* through *Peer 3 Object* attributes references another Anti-Passback object, while the *Star Center Object* attribute is blank. This way, a network of up to four Anti-Passback objects on four different controllers can serve a single anti-passback area. The entities' anti-passback times are stored in each controller's local database, which are kept informed about any anti-passback status changes at the other controllers. The *Peer 1 Object* through *Peer 3 Object* attributes of a single Anti-Passback object must not reference itself or the same object more than once, and all peers must reference all other peers in the area.

Figure 4 shows a valid configuration of a single Anti-Passback area "A" being managed by Anti-Passback objects on controllers 1 through 4, working in shared anti-passback mode.

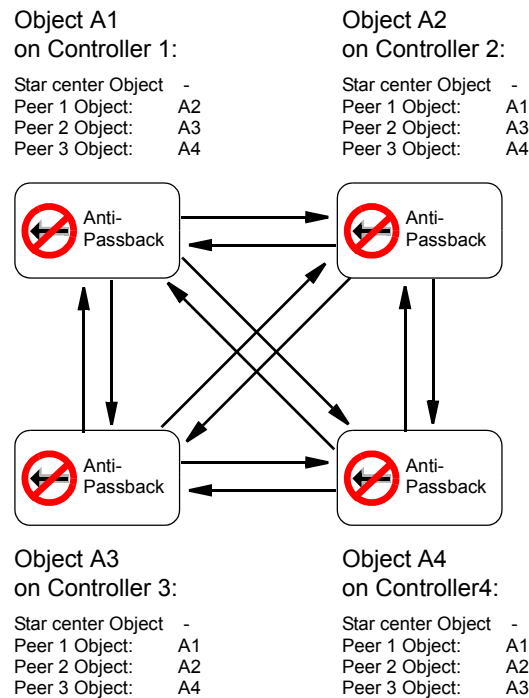


Figure 4: Shared Anti-Passback Mode

In the above scenario, an Anti-Passback object sets its *Mode* attribute to invalid, and its *Present Value* attribute to not operational, if it detects any entries in both its *Star Center Object* attribute and one or more of its *Peer 1 Object* through *Peer 3 Object* attributes, or if it references the same object more than once. Each Anti-Passback object in shared mode signs up for the *Present Value* attributes of all of its peer Anti-Passback objects. The sign-up mechanism is the only source for updating the *Peer 1 Status* through *Peer 3 Status* attributes.

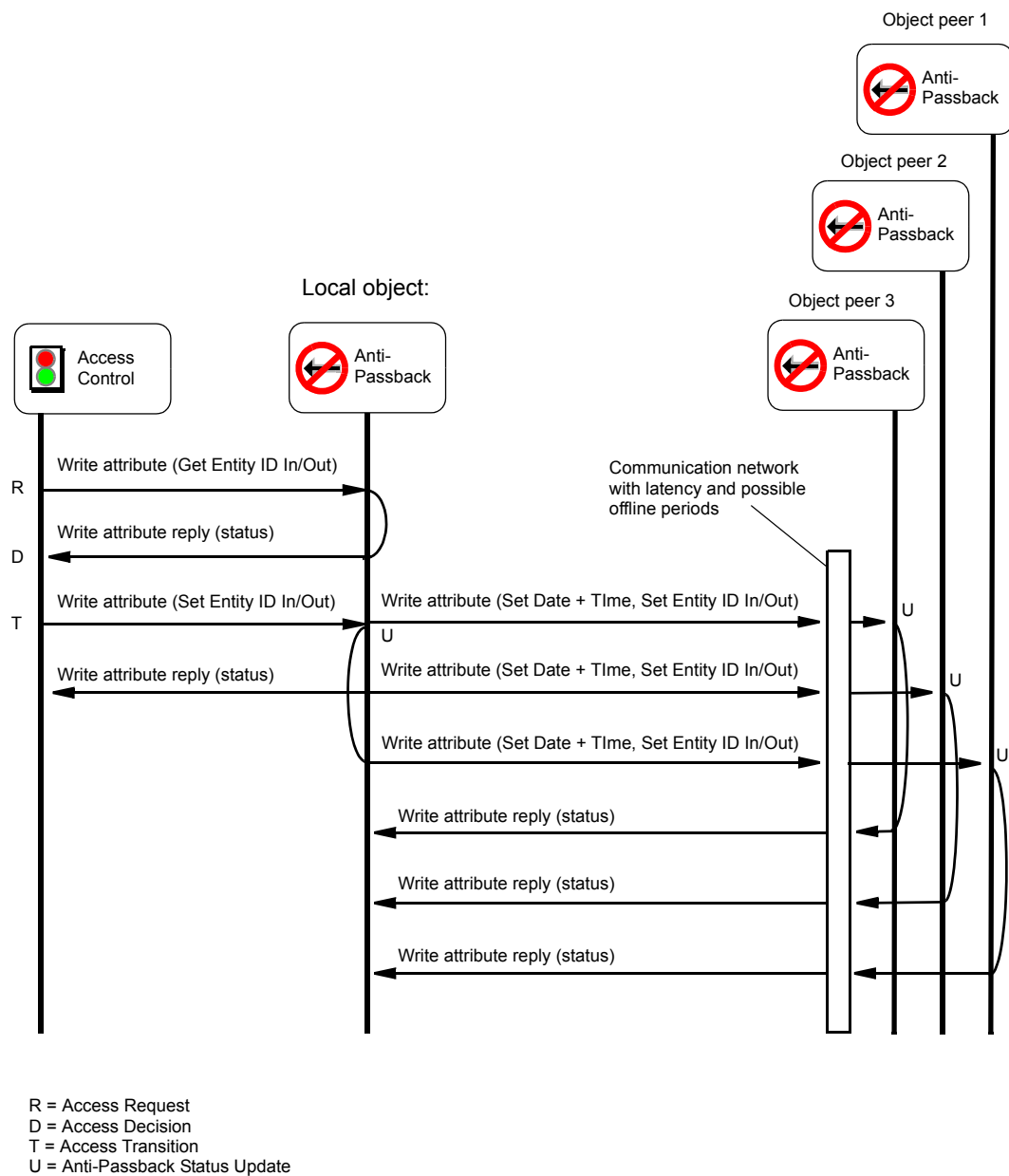


Figure 5: Shared Anti-Passback Application

As with every distributed system, the anti-passback feature in shared mode is subject to the risk of having its components disconnected.

Central Anti-Passback Application

The Anti-Passback object operates in central mode, when all of the *Peer 1 Object* through *Peer 3 Object* attributes are blank, and the *Star Center Object* attribute references a central Anti-Passback object. The anti-passback status of the entities is stored only in the database of the controller that the central Anti-Passback object resides on.

Figure 6 shows a valid configuration of a single Anti-Passback area “A” being managed by five Anti-Passback objects on controllers 1 through 5, working in central anti-passback mode.

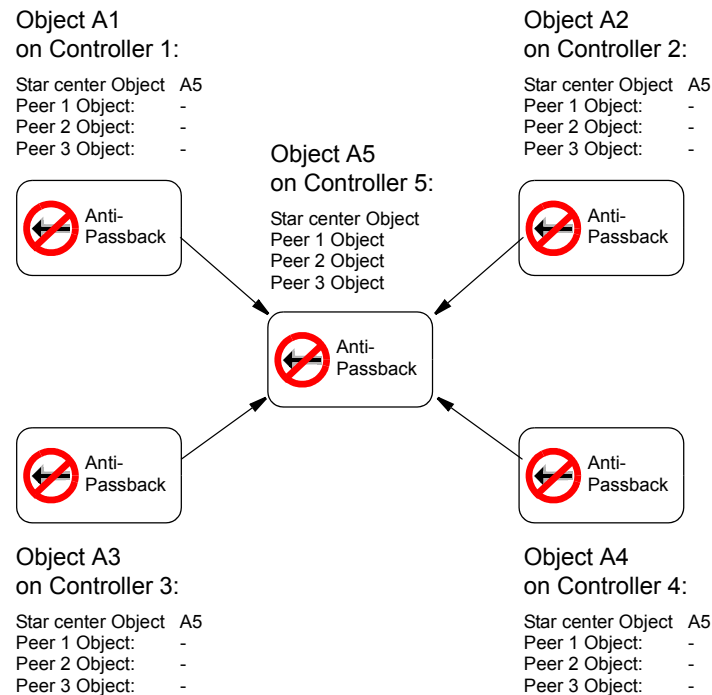


Figure 6: Central Anti-Passback Mode

An Anti-Passback object sets its *Mode* attribute to invalid, and its *Present Value* attribute to not operational, if it detects any entries in both its *Star Center Object* attribute and one or more of its *Peer 1 Object* through *Peer 3 Object* attributes.

Each Anti-Passback object in central mode signs up for the *Present Value* attributes of the central Anti-Passback object. The sign-up mechanism is the only source for updating the *Star Center Status* attribute.

Figure 7 shows the typical sequence of events in central anti-passback mode, under the assumption that the local Anti-Passback object is not the one in the star center, and that the central Anti-Passback object is online.

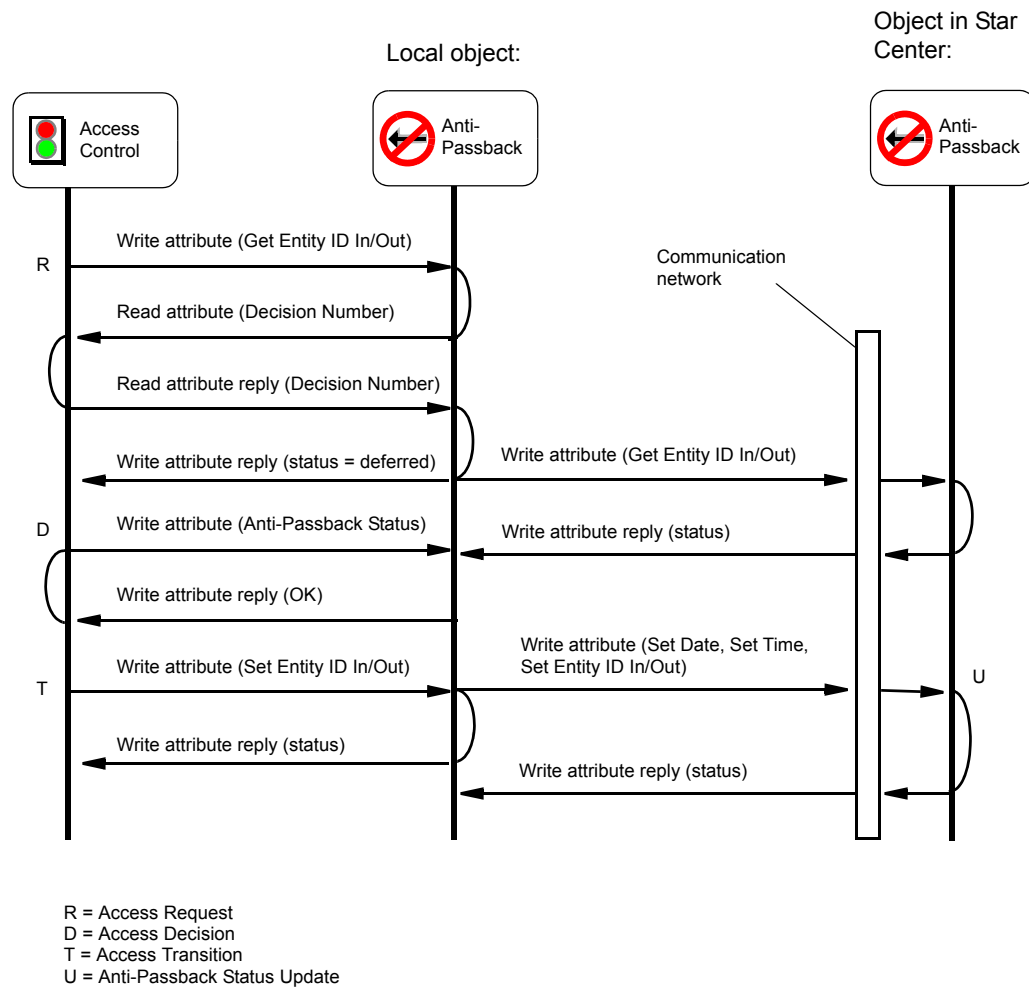


Figure 7: Central Anti-Passback Application

When the Anti-Passback object's *Get Entity ID In* or *Get Entity ID Out* attributes are written to, the Anti-Passback object, when assuming that the central Anti-Passback object is online, reads the *Decision Number* attribute from the requesting object before returning the status of deferred. The decision number is required to associate an asynchronously incoming anti-passback decision with the correct request. If the requesting object does not have a *Decision Number* attribute, the decision number will be assumed to be 0 when returned to the original requester once the anti-passback decision is in.

The Anti-Passback object in central mode sends a Write Multiple Attribute Request to the central Anti-Passback object's *Set Date*, *Set Time* and *Get Entity ID In* or *Get Entity ID Out* attribute, containing the ID of the entity that the entry-exit status is requested for.

If the reply does not match any outstanding requests, no further action is taken. Otherwise, the Anti-Passback object updates the initiating object's *Anti-Passback In Status* attribute for entry requests, or the *Anti-Passback Out Status* attribute for exit requests. As with every distributed system, the anti-passback feature in central mode is subject to the risk of having its components disconnected.

Figure 8 shows the sequence of events under the assumption that the local Anti-Passback object is not the one in the star center, and that the central Anti-Passback object is offline.

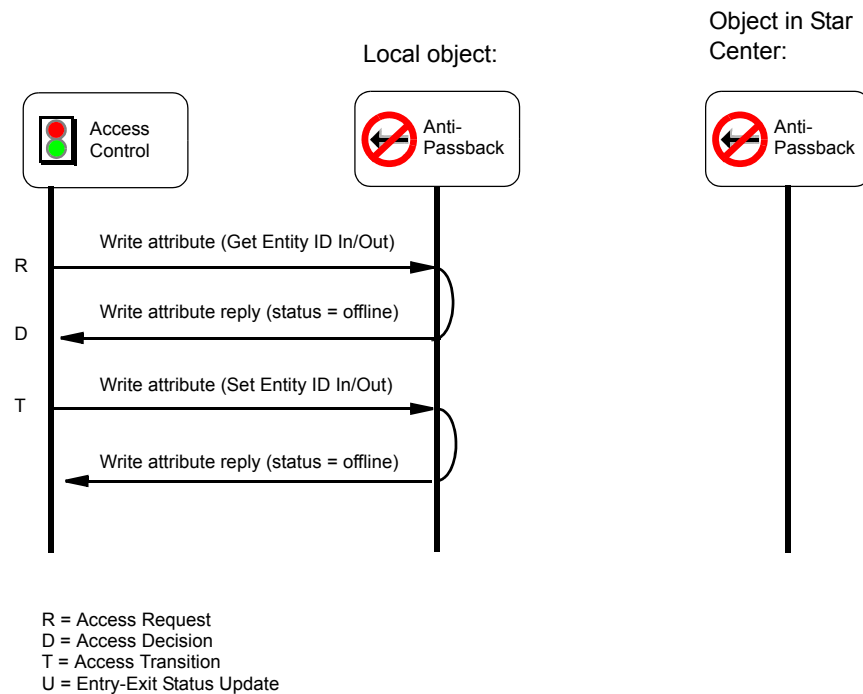


Figure 8: Anti-Passback Application: Example

If the Access Control object is configured to deny access while the central Anti-Passback object is offline, the transition does not occur. The central Anti-Passback object handles all local requests as if it was in local mode.