Avaya Solution Interoperability Test Lab

Configuring Avaya one-X® Agent 2.0 R2 with Citrix XenApp™ on Microsoft Windows 2003 (32-bit) Server – Issue 1.0

Abstract

This Application Note describes the configuration, performance, and capacities of Avaya one-X® Agent 2.0 on the Citrix XenApp™ Windows 2003 (32-bit) server.

- Configuration of one-X® Agent 2.0 R2 on Citrix is presented for telephony capabilities only. Presence and Instant Messaging are not covered.
- Avaya one-X® Agent 2.0 R2 was tested in Desk Phone and Other Phone Modes, as audio via My Computer Mode is not supported on Citrix.
- Performance and capacities of one-X® Agent 2.0 on a standard server consisting of dual 2.8GHz quad core processors with 16GB of RAM.

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1. Introduction

The tested configuration consisted of a Windows 2003 (32-bit) server with Citrix XenApp™ 5.0 server. Citrix XenApp ™ Server is configured to provide Avaya one-X® Agent 2.0 as a hosted application. Avaya one-X® Agent was configured to leverage the ACD features from an Avaya Aura™ Communication Manager 5.2.1, Service Pack 1. The Citrix XenApp™ Server was licensed to support 100 users.

Agent call scenarios for performance measurements consisted of typical Automatic Call Distributor (ACD) calls, agent transferred calls, and agent conference calls, with the intention of providing a set of realistic conditions for a typical contact center. The distribution of call types was 70% ACD, 20% transfer, and 10% conference.

To support the large number of Avaya one-X® Agents during testing, both a virtual infrastructure and automated tools were utilized. The virtual infrastructure provided windows client sessions for the Citrix XenApp™ users running Avaya one-X® Agent, and supported the automated tools. Caller and agent phones were provided by internal Avaya automation tools as well as many real phone types typically used in call centers.

1.1. Interoperability Testing

Several test scenarios, were tested to provide a reasonable mixture of normal ACD agent activities. The details of each test scenario are outlined in **Section 5**. Preliminary testing with Avaya one-X® Agent and the Citrix XenApp™ 5.0 server revealed that the maximum number of agents that the server could manage was 100. Typical ACD call scenarios were utilized to determine impacts on CPU occupancy and RAM utilization.

1.2. Product Descriptions

The following describes the components used for Avaya one-X® Agent 2.0 R2 with Citrix XenApp™ on Windows 2003 (32-bit) Server.

Avaya one-X® Agent 2.0: http://www.avaya.com/usa/product/avaya-one-x-agent
Avaya one-X® Agent is an integrated telephony softphone solution that provides seamless connectivity to at-home agents, remote agents, outsourced agents, contact center agents, and agents interacting with clients having vocal and hearing impairment.

- Desk Phone Mode: Desk Phone mode leverages an agent's ability to control his desk phone from his PC. This is also known as shared control as the desk phone can be used with the PC control.

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- Other Phone Mode: Other Phone mode leverages an agent's ability to utilize a phone at another location leveraging all the same features as if the desk phone was nearby. This is also known as telecommuter.

Citrix XenApp Server™ 5.0:
http://www.citrix.com/English/ps2/products/product.asp?contentID=186&ntref=prod_top
Citrix XenApp™ is a Microsoft Windows® application virtualization solution that centralizes application management in the datacenter and delivers applications on-demand to users anywhere using any device.

1.3. Avaya one-X® Agent 2.0 Features Not Tested

- Presence and Instant Messaging
- Audio via "My Computer," Video via Avaya AVTS and Soft TTY – not supported for Citrix

1.4. Support

Technical support for the Citrix solution can be obtained by contacting:

- URL – www.MyCitrix.com
- Citrix Technical Support: 1-800-424-8749

1.5. Acronyms

ACD	Automatic Call Distributor
AVTS	Avaya Video Telephony Solution (AVTS) – enables videoconferencing for desktop applications and group video communications
CM	Avaya Aura™ Communication Manager
CPU	Central Processing Unit
IM	Instant Messaging
MR	Modification Request
PC	Personal Computer
RAM	Random Access Memory
SIL	Solution Interoperability Lab
TTY	Text Telephone (use of telephones for the hearing impaired)
VDN	Vector Directory Number

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2. Reference Configuration

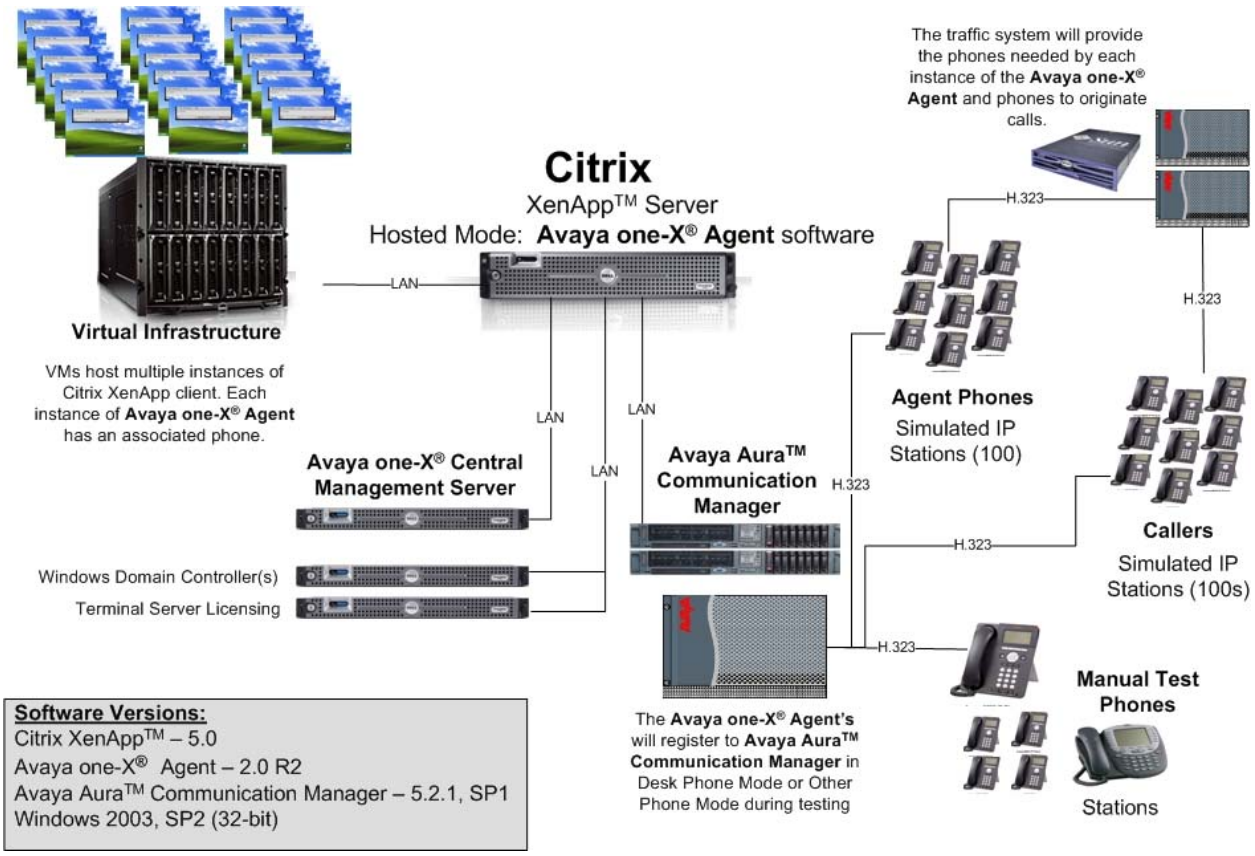

Figure 1

2.1. Assumptions

- Avaya one-X® Agent Central Management server is installed and configured.
- Avaya Aura™ Communication Manager has been configured and is operational.
- Agents and their respective stations are configured on Avaya Aura™ Communication Manager.
- Citrix XenApp™ Server is installed, configured and operational on Windows 2003 server.

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3. Equipment and Software Validated

The following equipment and software/firmware were used for the reference configuration provided:

Equipment	Software/Firmware
Avaya S8720 Servers (Duplex Mode, Processor Ethernet Enabled)	Avaya Aura™ Communication Manager 5.2.1 (R015x.02.1.016.4)
Avaya G650 Media Gateway	
TN2312BP IP Server Interface	HW12 FW22
TN799DP C-LAN Interface	HW1 FW32
TN2302AP IP Media Processor	HW21 FW118
Avaya one-X® Agent Dual 2.83GHz Quad Core Processor 16GB of RAM 300GB SATA drive	Release 2.0 R2 (Build 2.0.0.0.07610) Microsoft Windows 2003 Server 32-bit with Service Pack 2
Avaya 4600 and 9600 Series IP Telephones	
4621 (H.323)	3.1
9620 (H.323)	3.1
9630 (H.323)	3.1
9650 (H.323)	3.1
Citrix XenApp Server™ Dual 2.83GHz Quad Core Processor 16GB of RAM 300GB SATA drive	Release 5.0 Microsoft Windows 2003 Server 32 bit with Service Pack 2

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4. Configure Avaya one-X® Agent on the Windows 2003/Citrix XenApp™ Server

Avaya one-X® Agent was installed on the Windows 2003 server in the default installation location, C:\Program Files\Avaya\Avaya one-X Agent. This would be the shared application for all agents. No additional configuration is required on the server.

Instant Messaging and Presence Services: the Avaya one-X Agent Instant Messaging code-enabled remote desktop sharing capabilities, resulting in incompatibility issues for Citrix, and therefore was not evaluated.

Presence Services: Presence Services was not tested. Presence Services requires Instant Messaging capabilities that were not enabled.

Central Management: Avaya one-X® Agent was evaluated with Central Management enabled and not enabled.

4.1. Citrix XenApp™ Server 5.0

The following section provides more details on the reference configuration. Server configurations will vary depending on the entire Citrix solution being deployed. For this configuration, the Citrix XenApp server was on a single server with the Citrix farm and application hosting.

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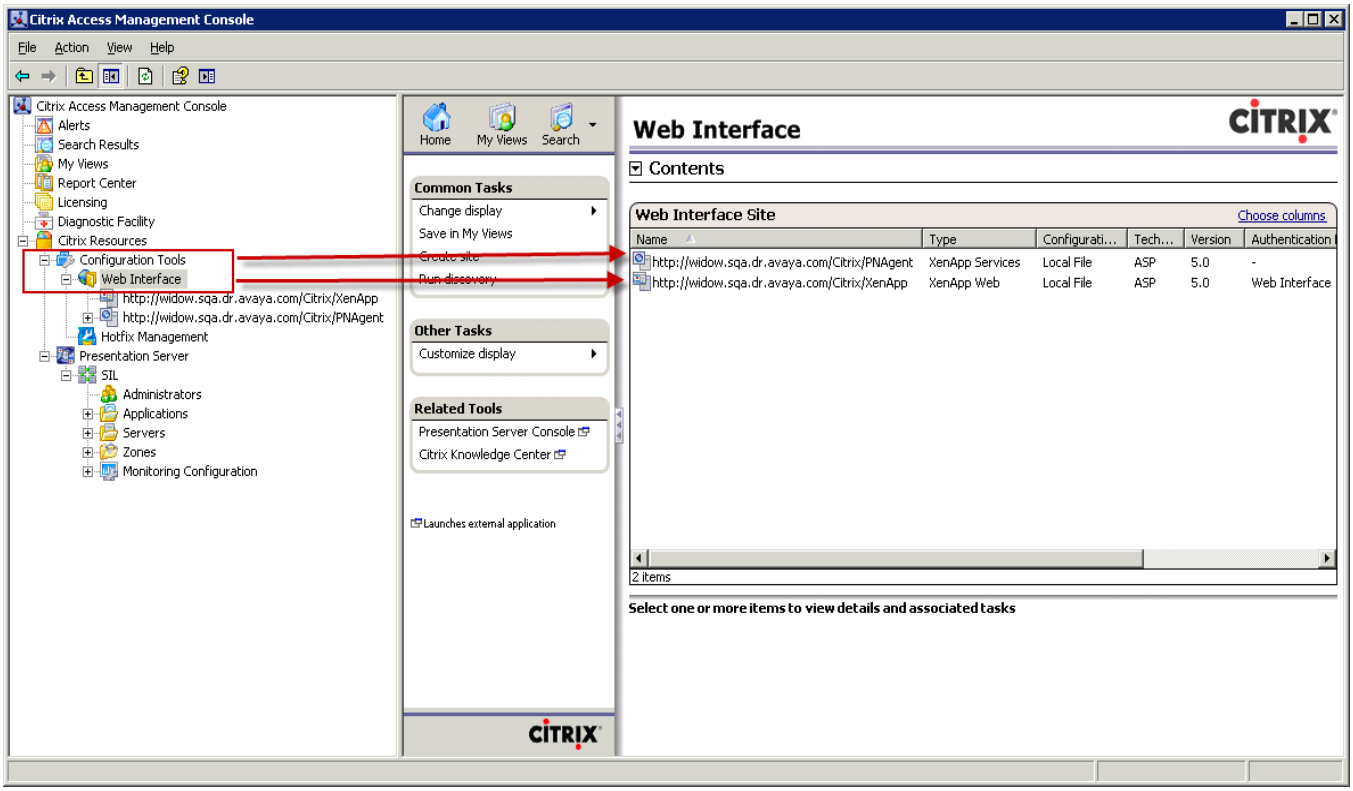
4.1.1. Citrix Services and Web Access

The Solution Interoperability Lab (SIL) Windows Domain was configured to support terminal services and provide authentication for the 100 Avaya one-X® Agents. Citrix was installed and configured to provide XenApp Service and XenApp web access. The web access is configured by creating/adding them to the Citrix Resources under the Web Interface section of the Citrix Access Management console. Note that this is the portal to gain access to the server.



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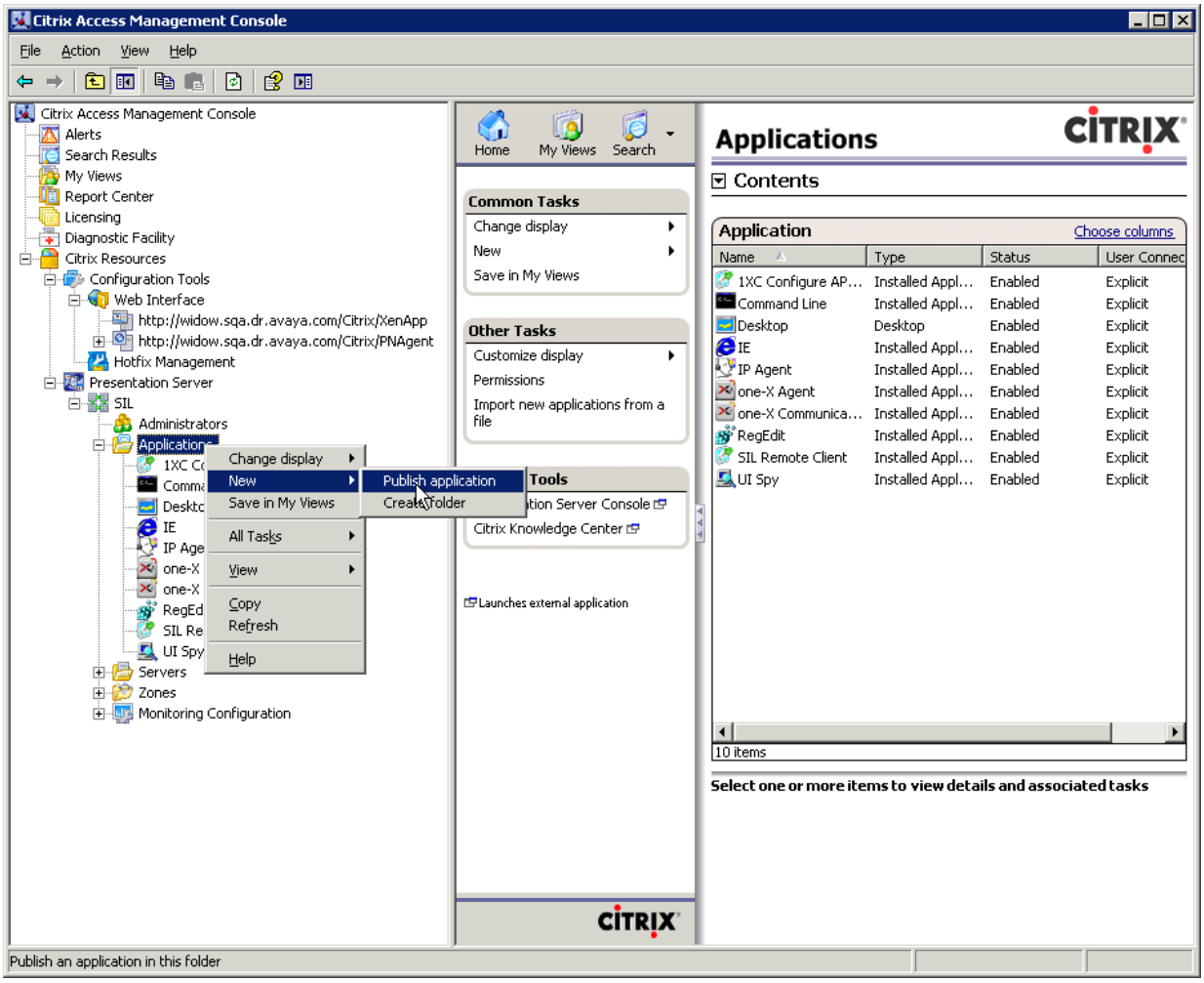
4.1.2. Add the Avaya one-X® Agent to the list of published applications

Using the menu options from the Presentation Server section of the Citrix Access Management Console, add Avaya one-X® Agent as a new published application by right-clicking to bring up the menu. Then select **Publish application**. The next few screens show the steps to complete the configuration.



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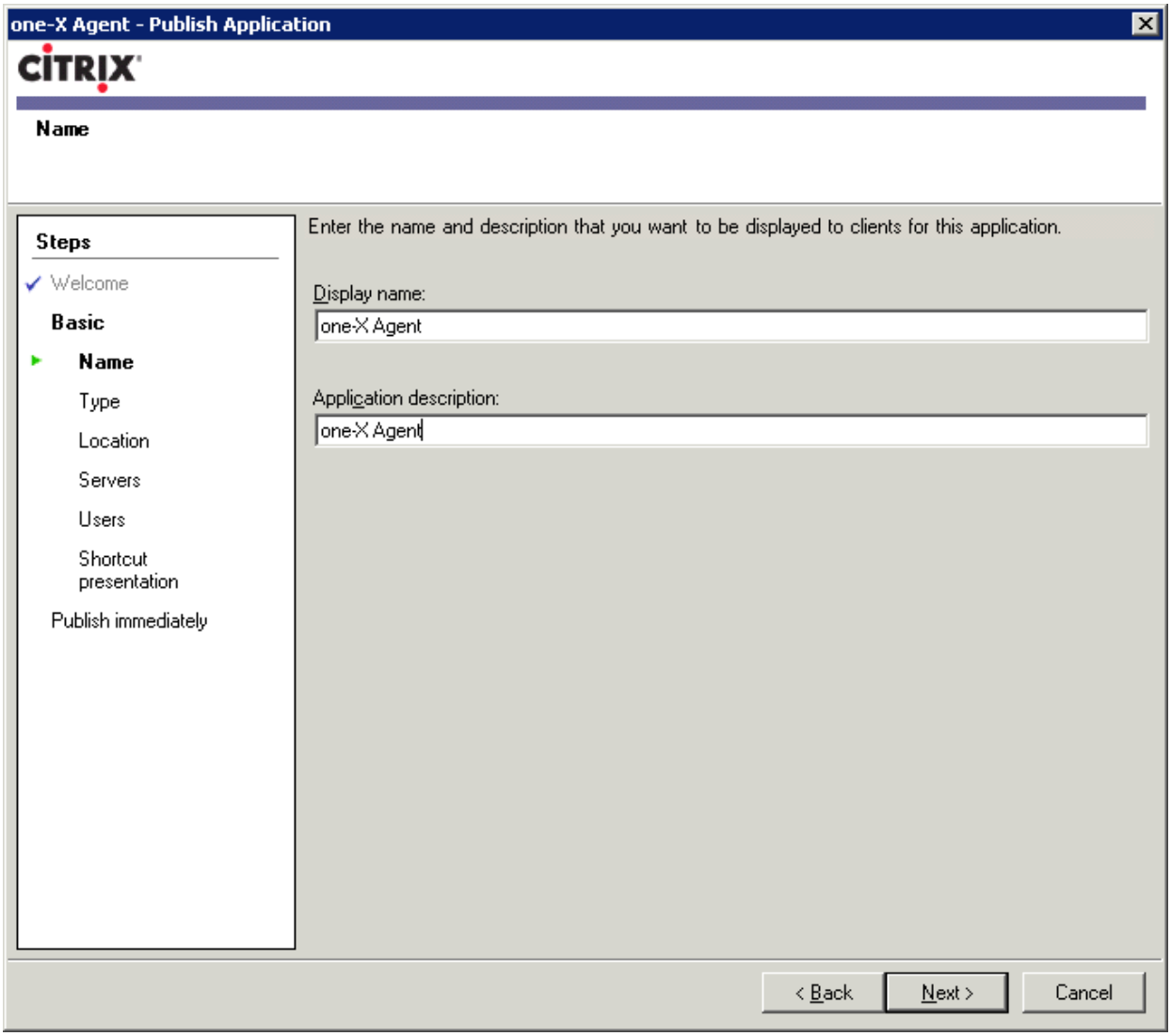
*Give the application a **Display name**, i.e. one-X Agent.



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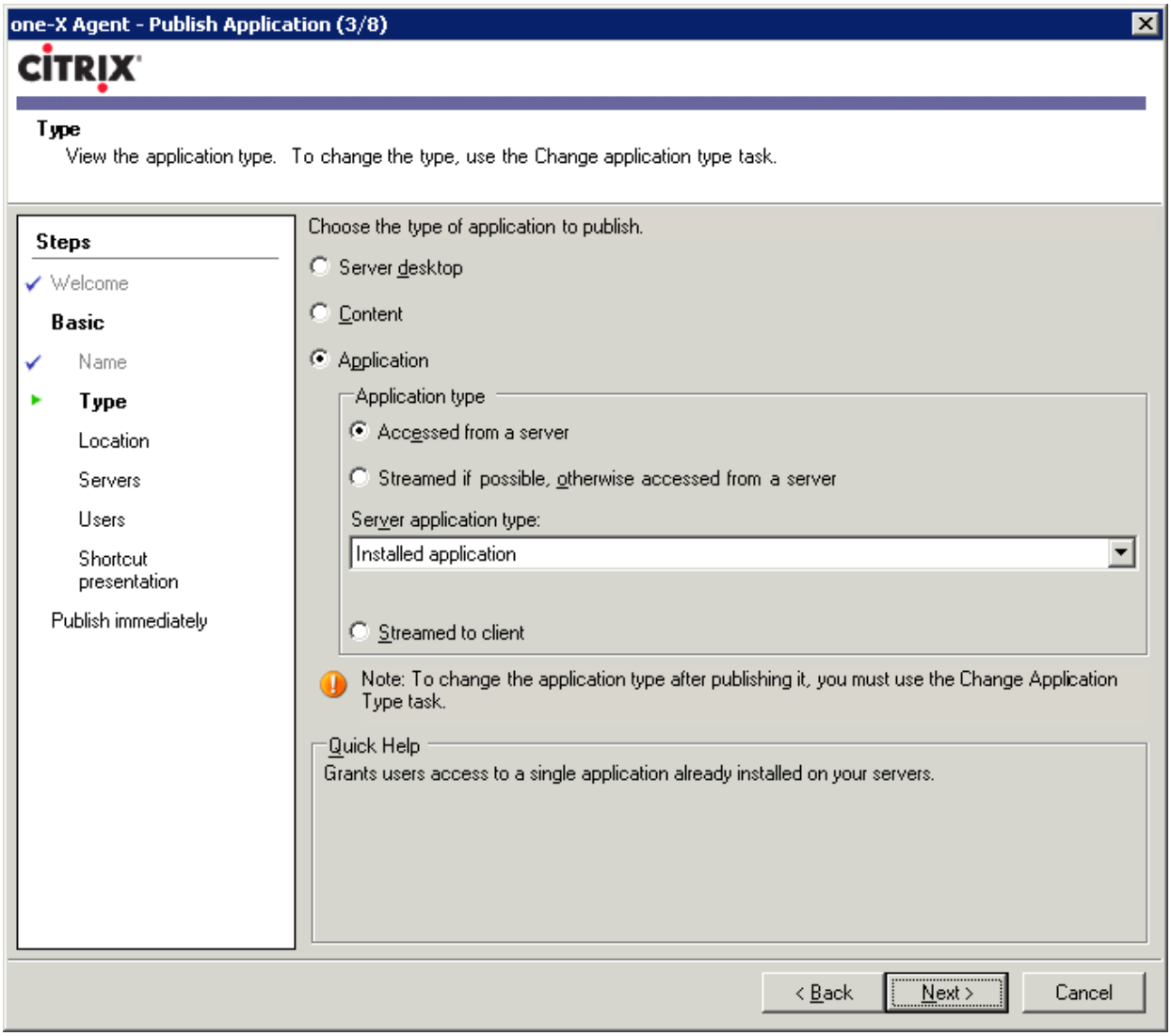
*Select **Accessed from a server**. This would be a server located within the Citrix farm.



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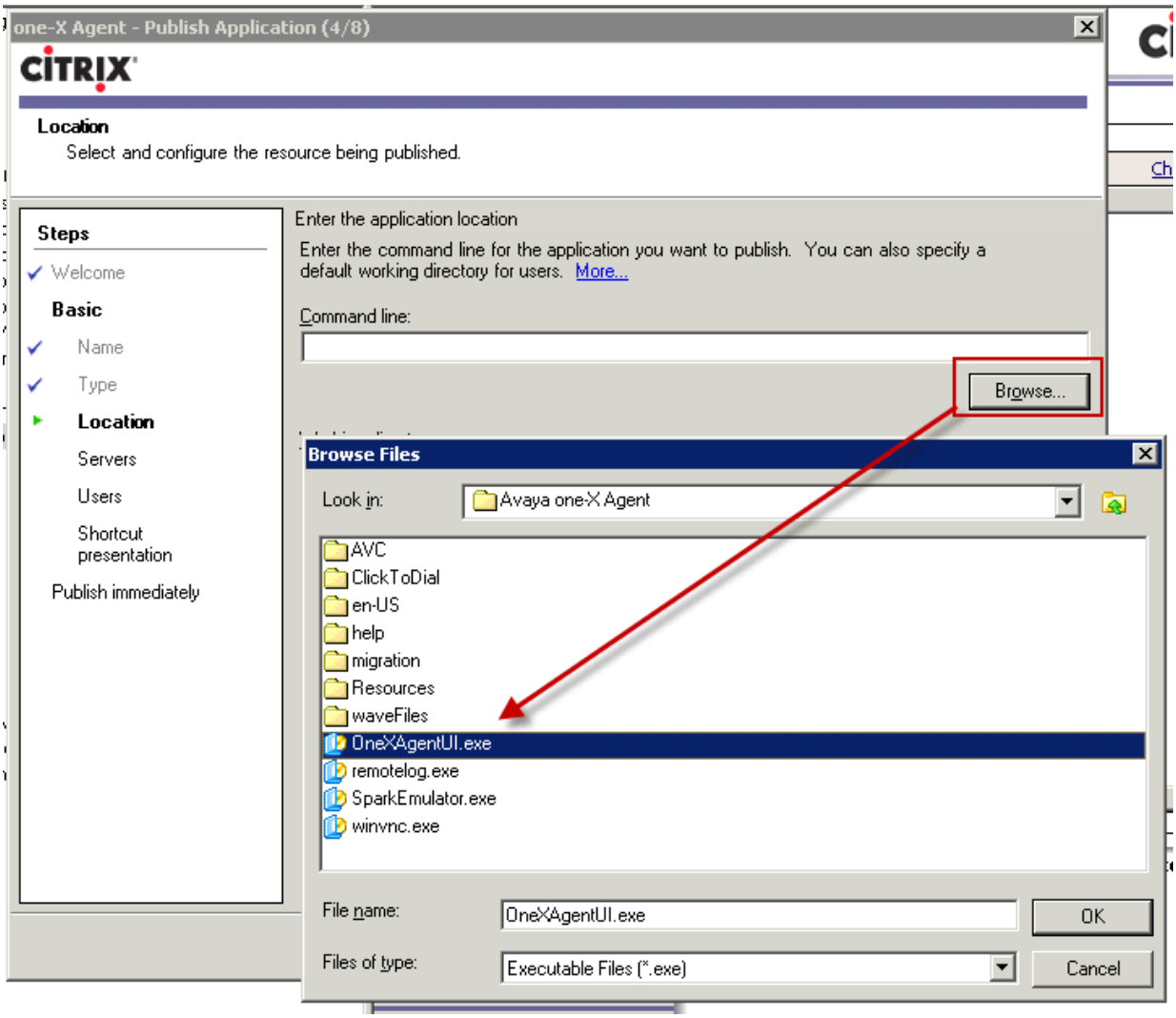
*Using the **Browse** button on the wizard, navigate to the folder location containing the Avaya one-X Agent executable. This is typically located in C:\Program Files\Avaya\Avaya one-X Agent. Select the OneXAgentUI.exe. This is the executable that starts the Avaya one-X® Agent and is the executable that will be launched from a Citrix session.



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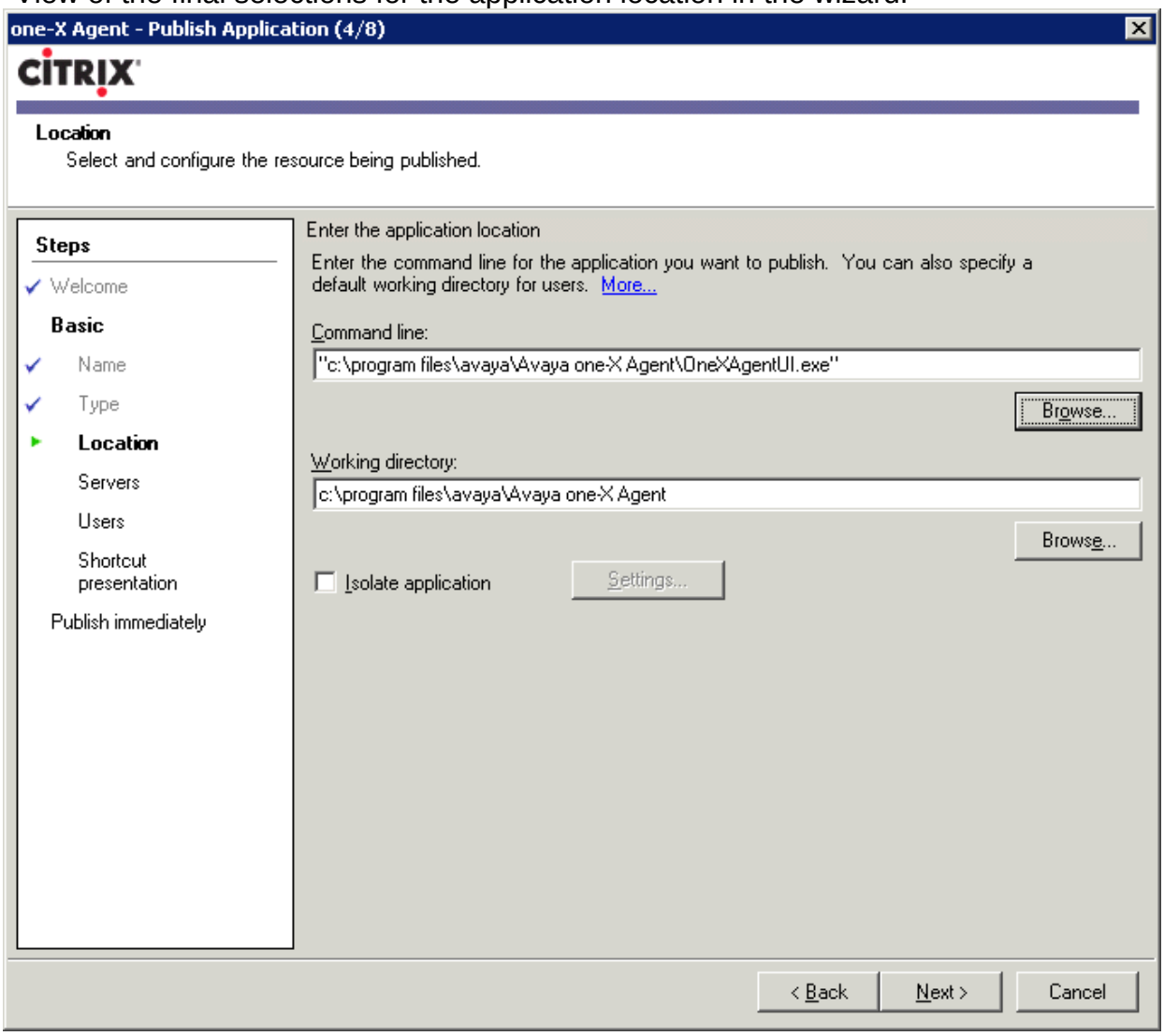
*View of the final selections for the application location in the wizard.



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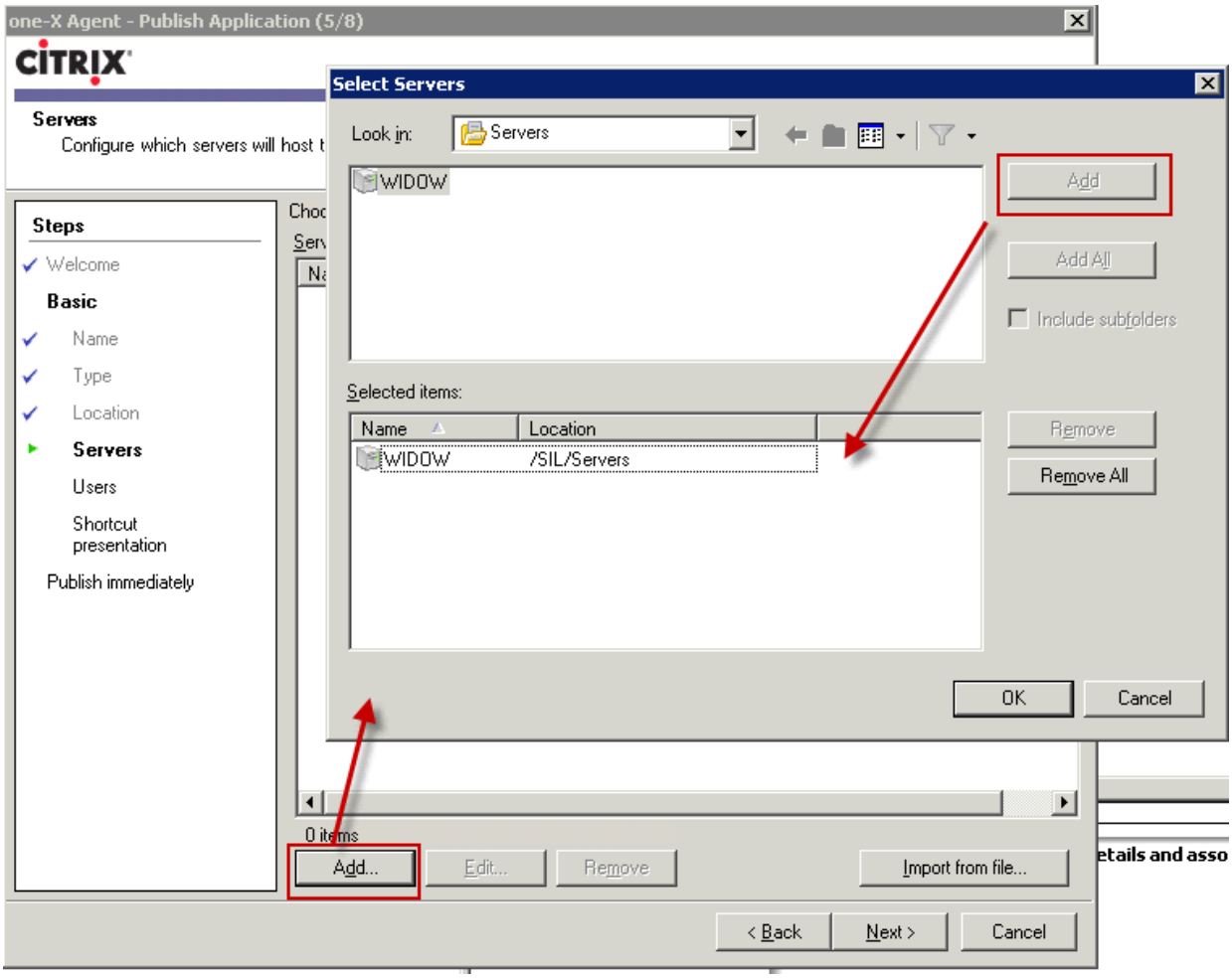
*Select the server that will be used to execute the Avaya one-X® Agent application. In a Citrix server farm, there may be more than a single server. For this test configuration, only one server was used. First select **Add** from the wizard dialog, which will start a new window allowing for selection of the server. Select the server and then **Add,** which will add the server to the lower section of the window. Select **OK** to complete adding a server.



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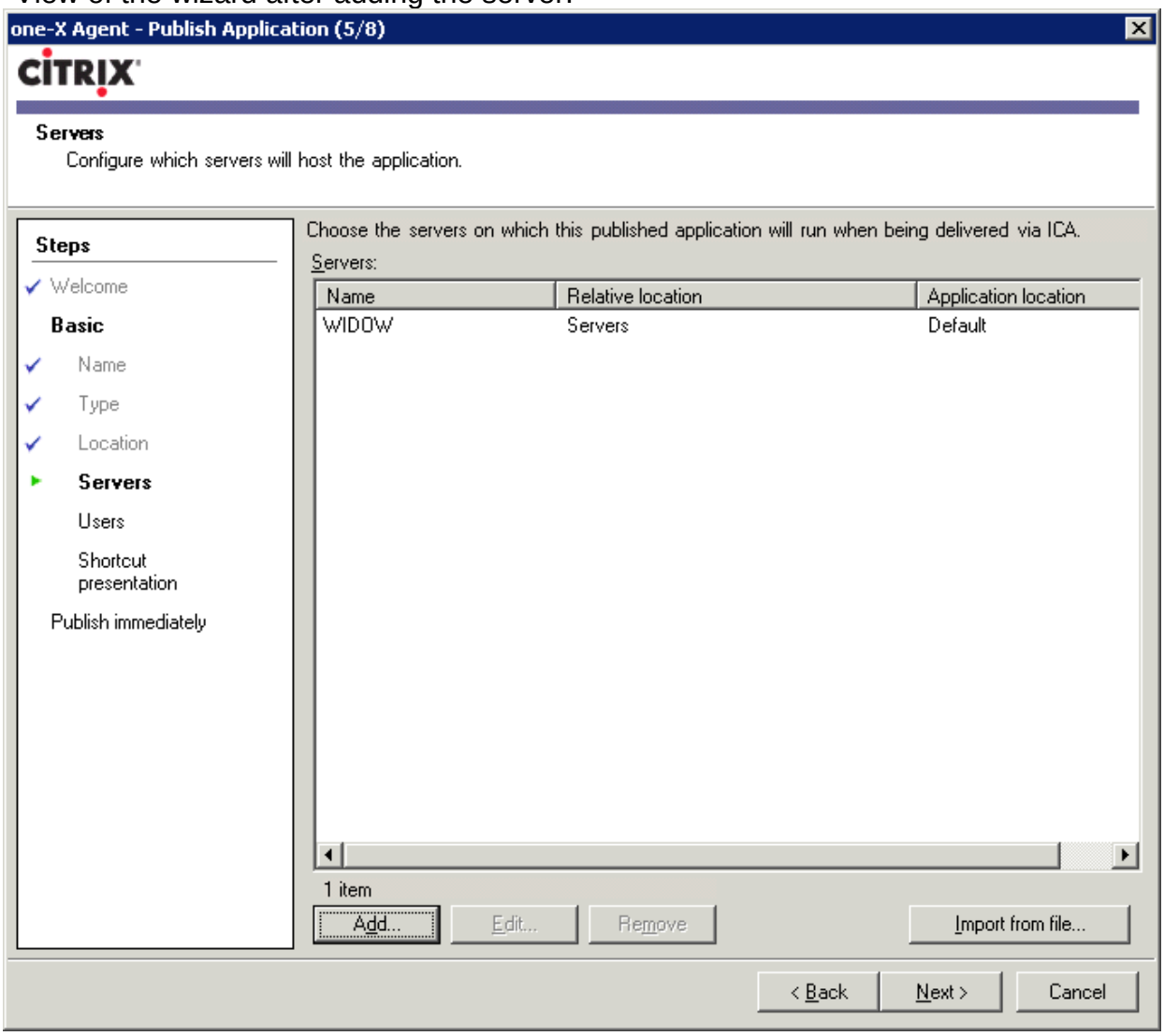
*View of the wizard after adding the server.



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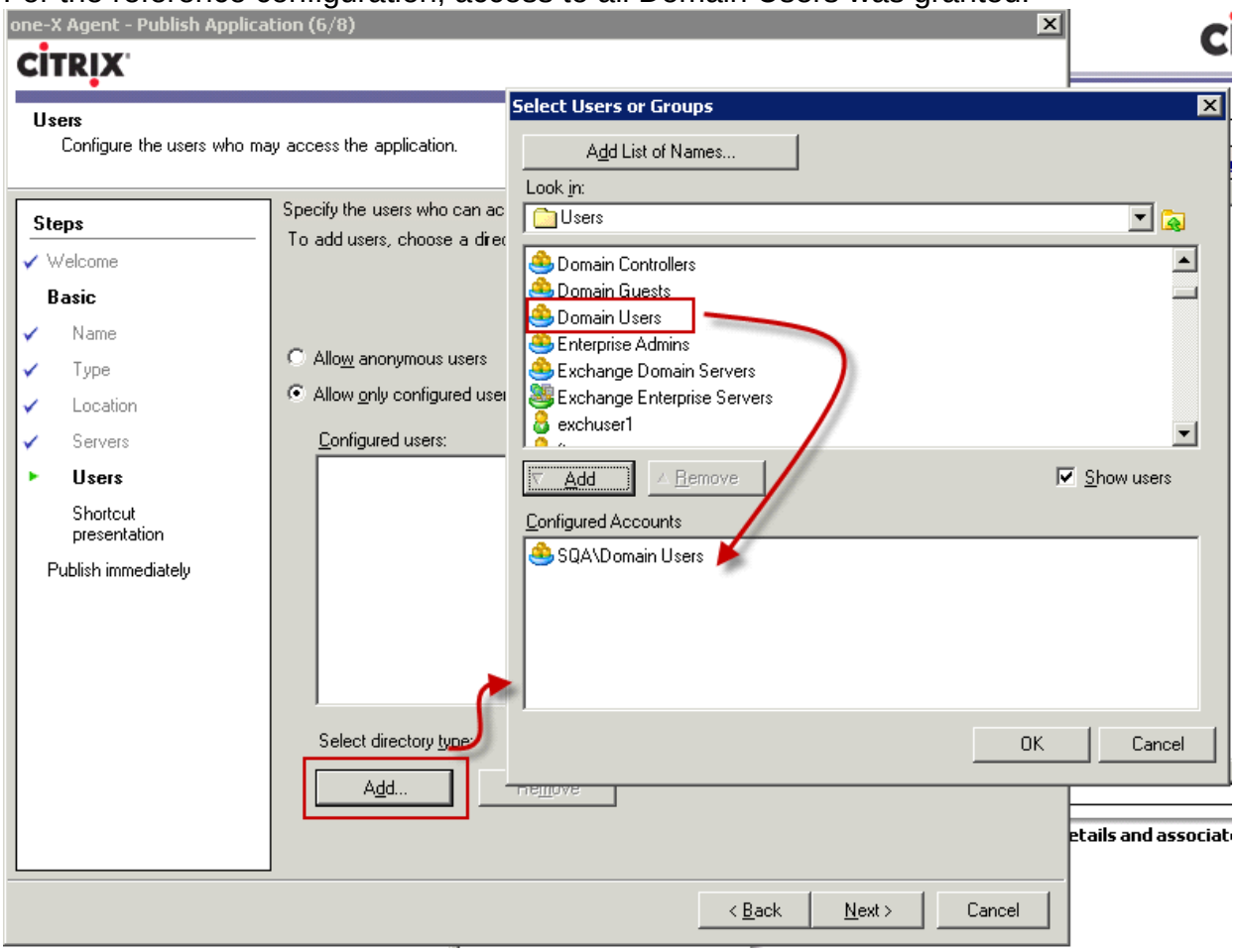
*Select the users that are allowed to execute the application by selecting **Add**. Within the **Select Users or Groups** dialog, select the users for whom you're granting access. For the reference configuration, access to all Domain Users was granted.



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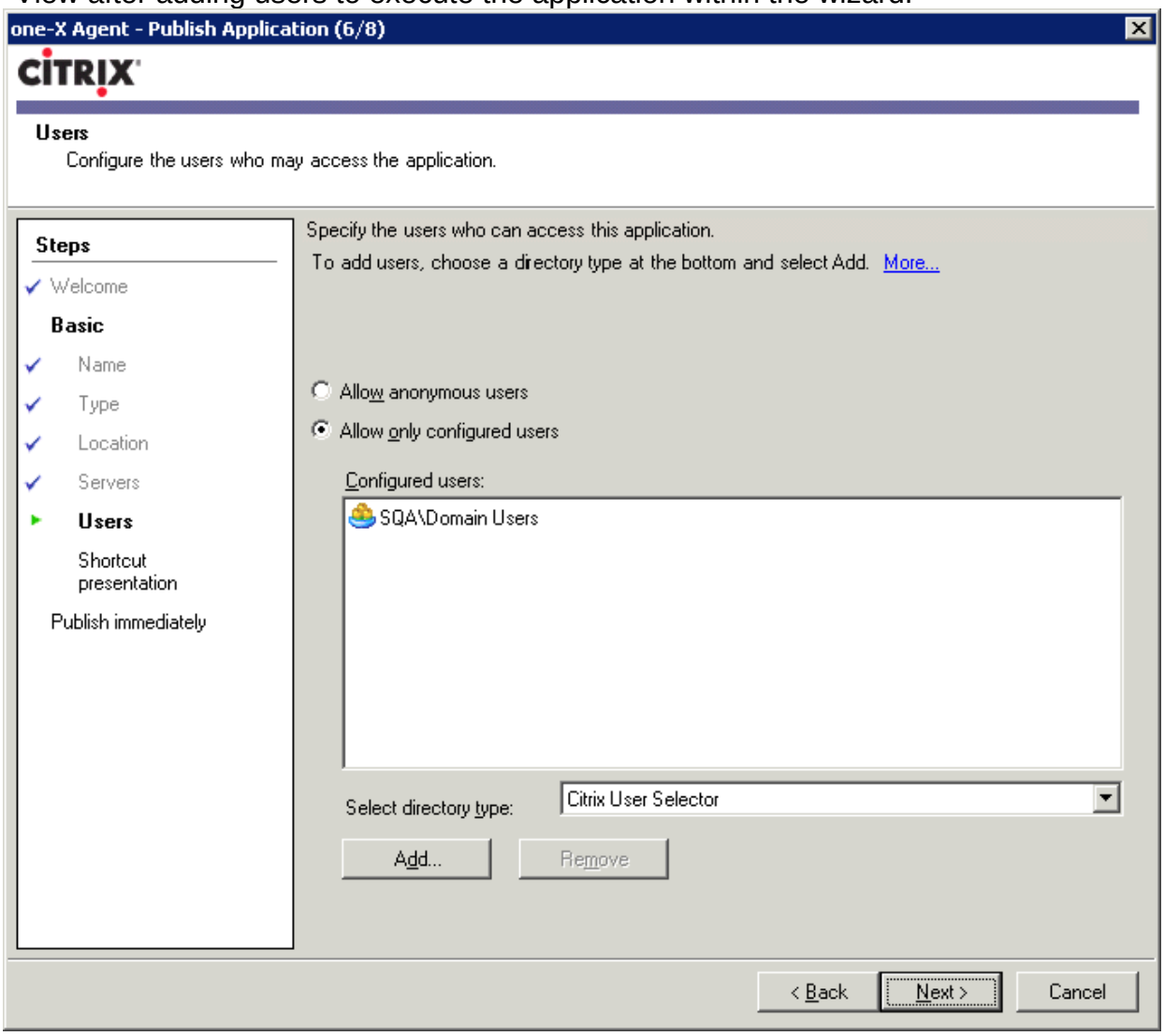
*View after adding users to execute the application within the wizard.



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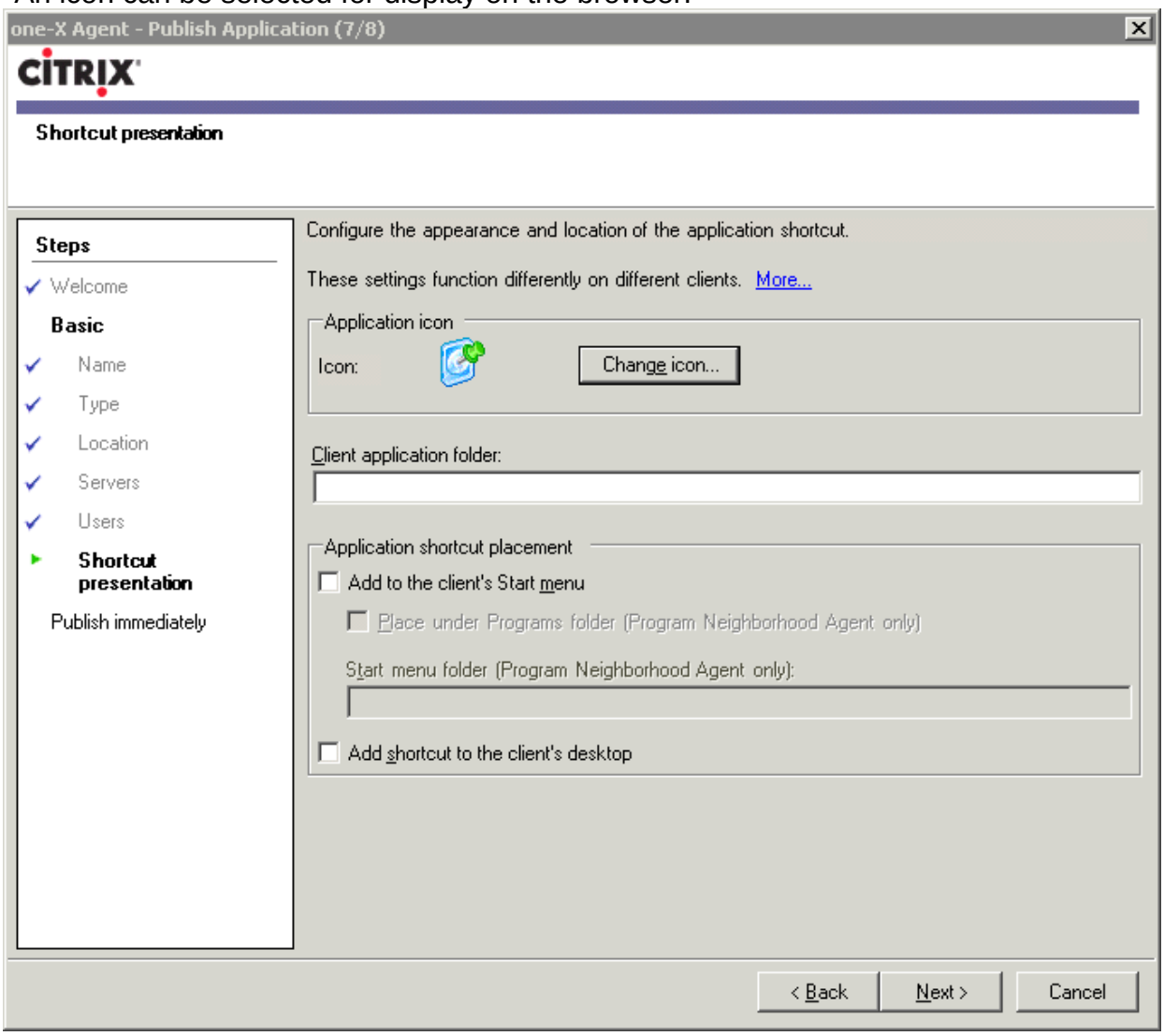
*An icon can be selected for display on the browser.



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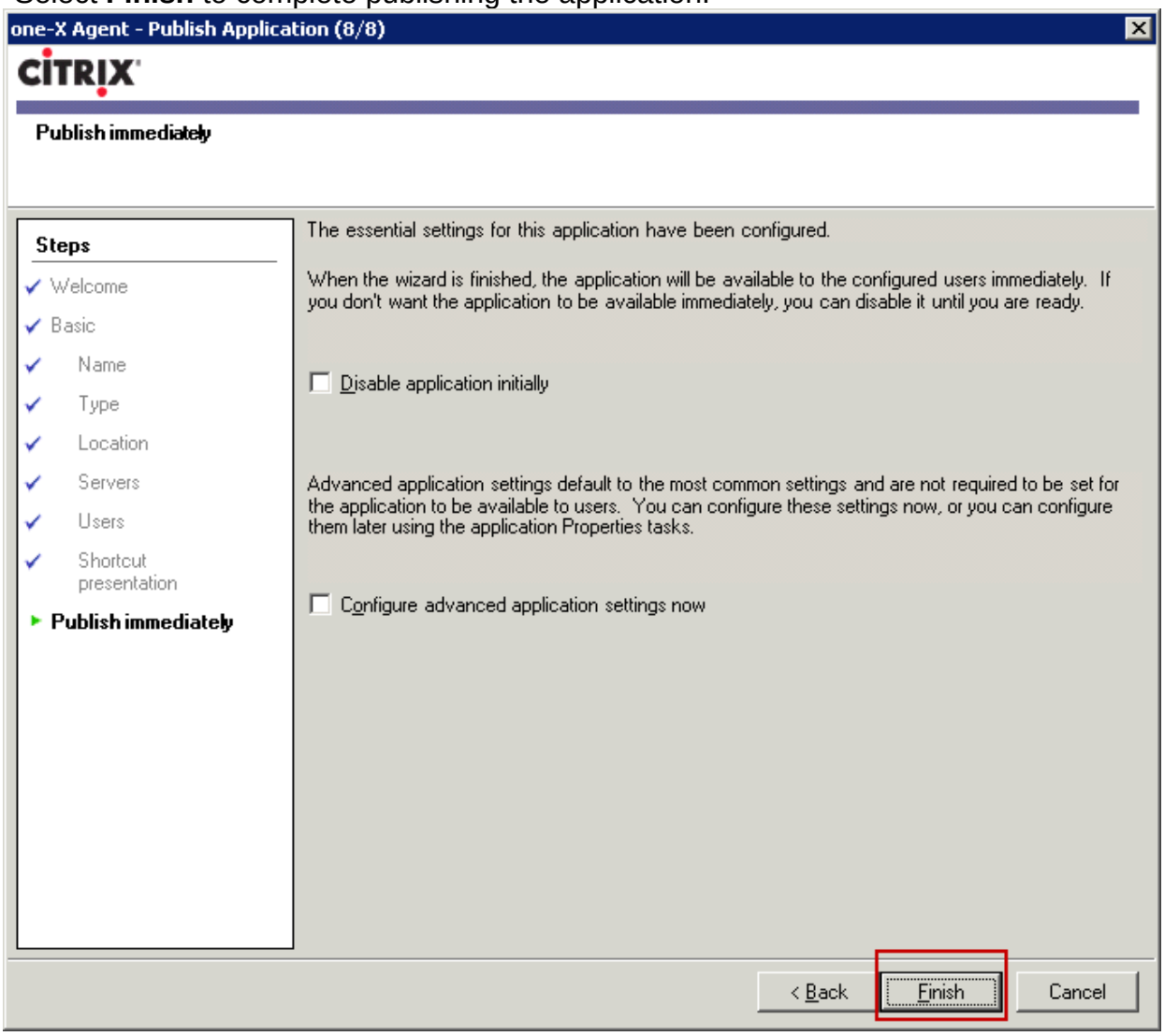
*Select **Finish** to complete publishing the application.



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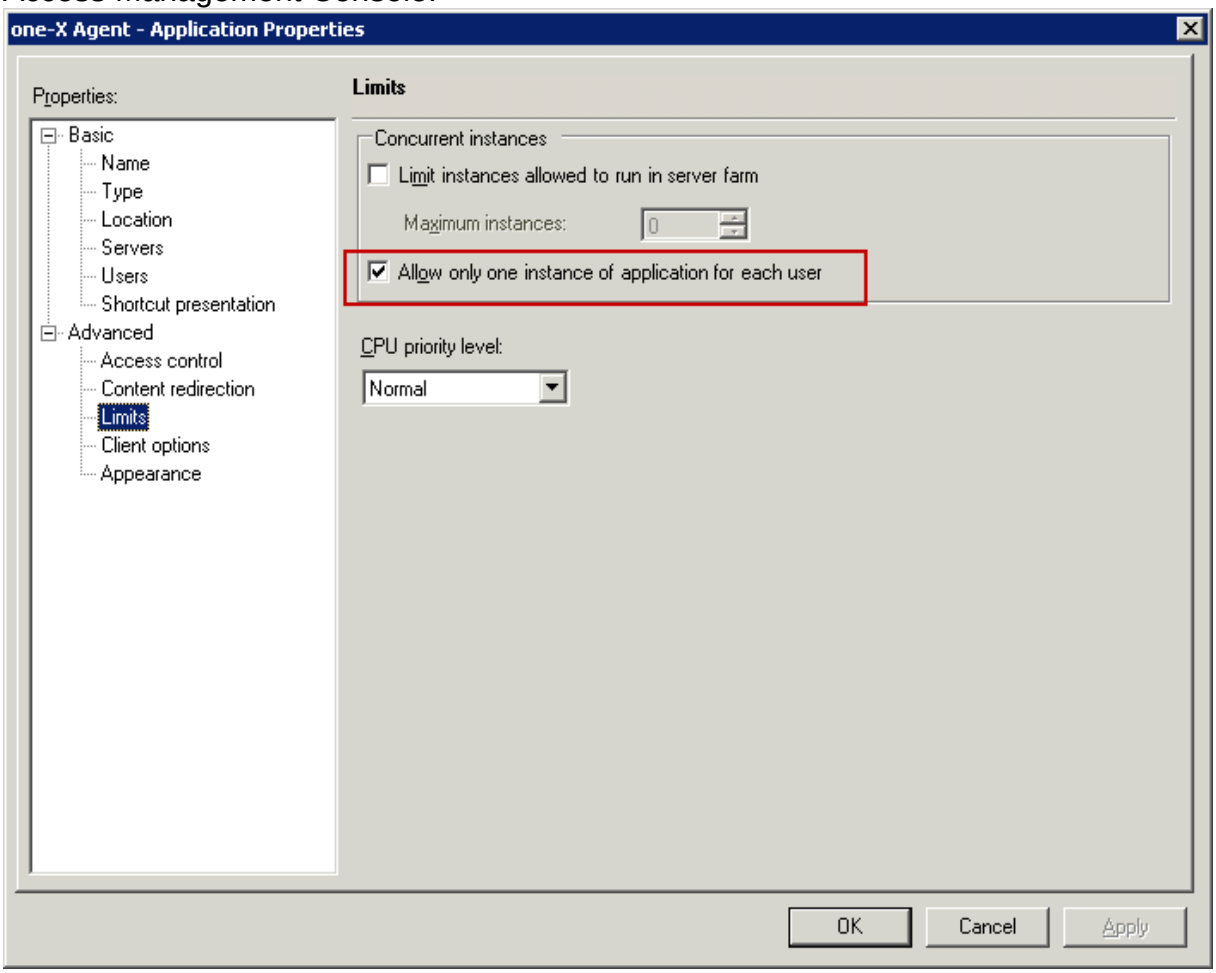
*__Optional Advanced Setting__. Because an agent can login to the ACD only once, it is recommend that the application be set to allow only one instance for each user. This property is set by selecting the properties of the published application from the Citrix Access Management Console.



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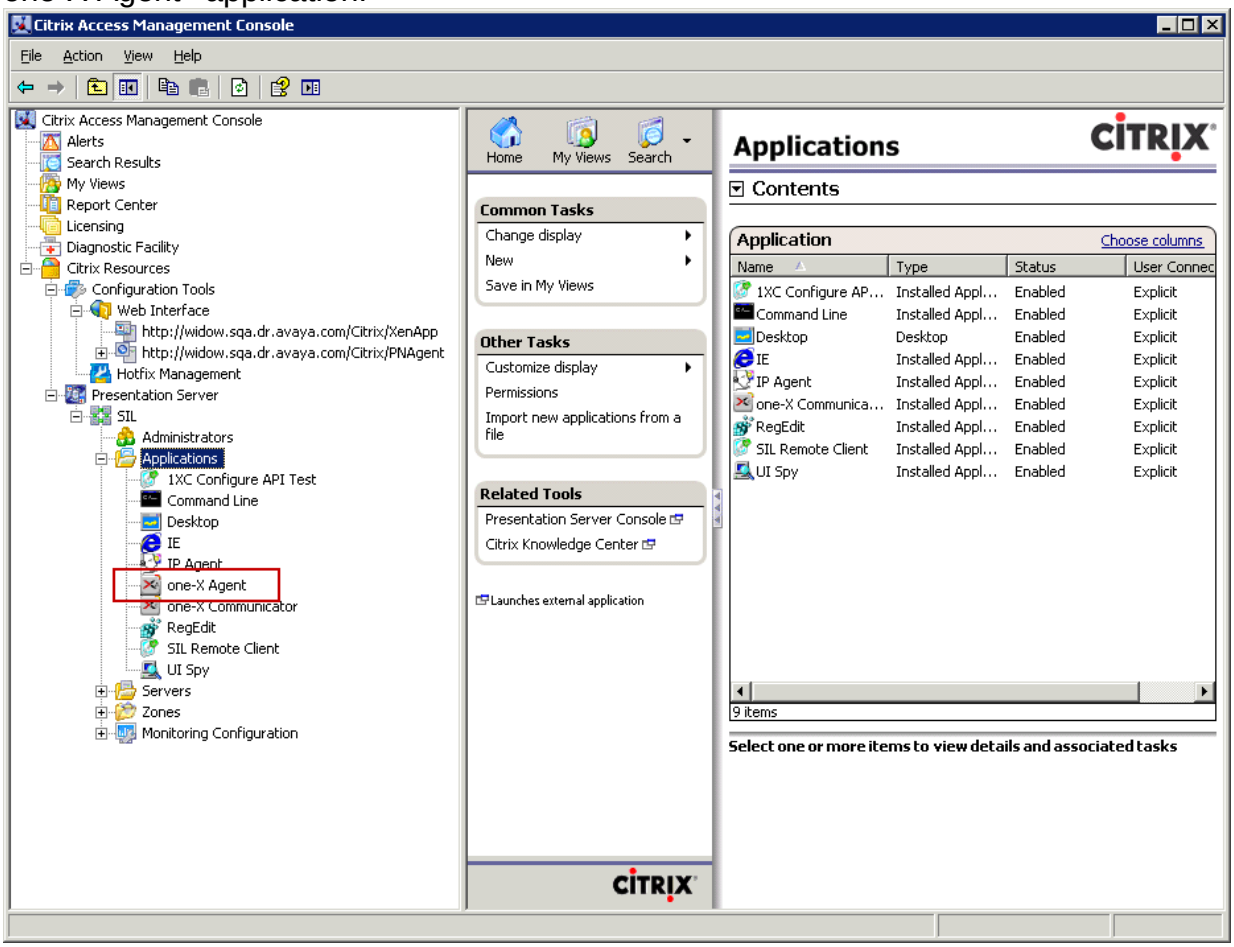
*View from the Citrix Access Management Console. Note the newly created Avaya one-X Agent® application.



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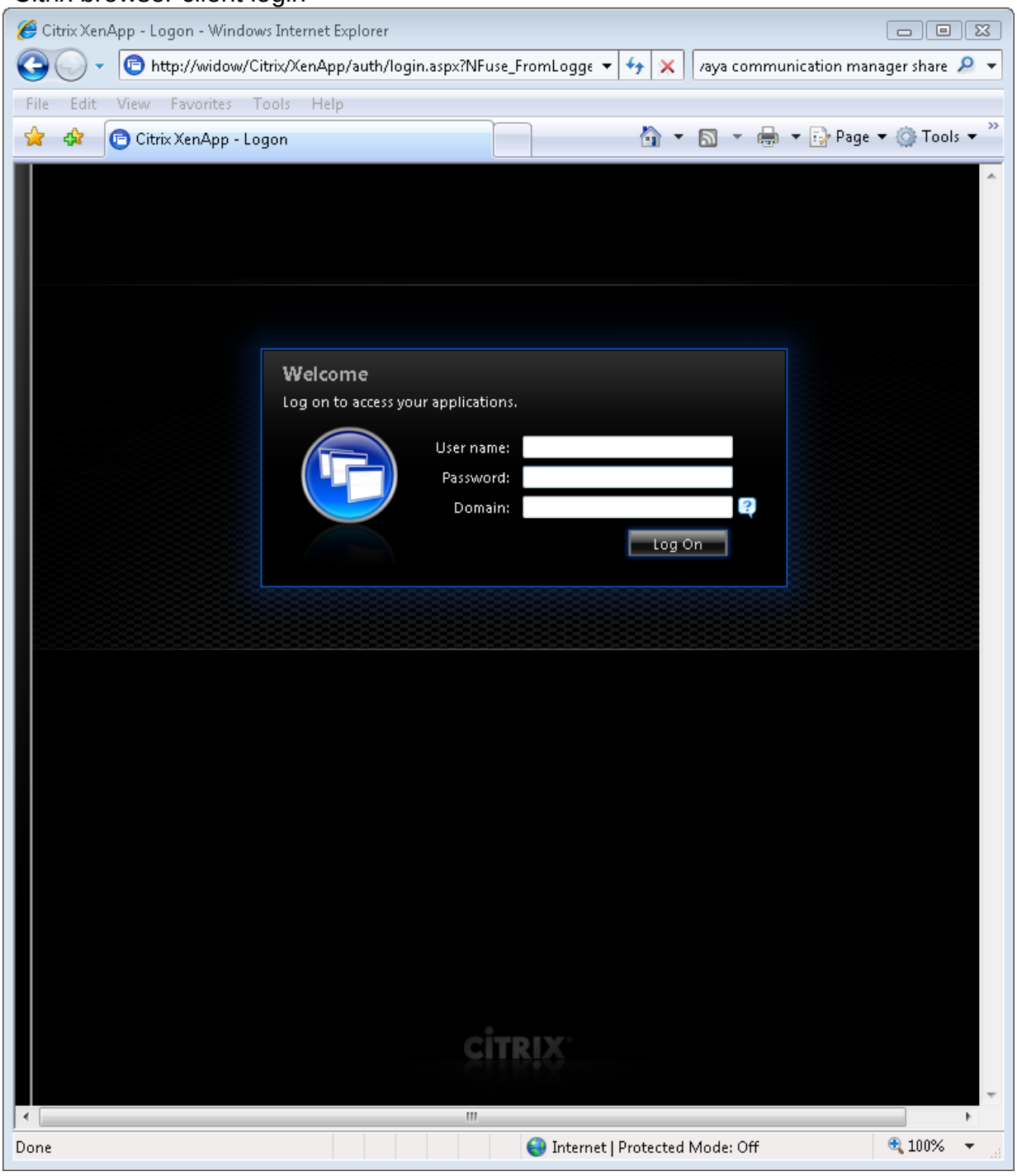
4.1.3. Starting the Avaya one-X® Agent Application

*Citrix browser client login



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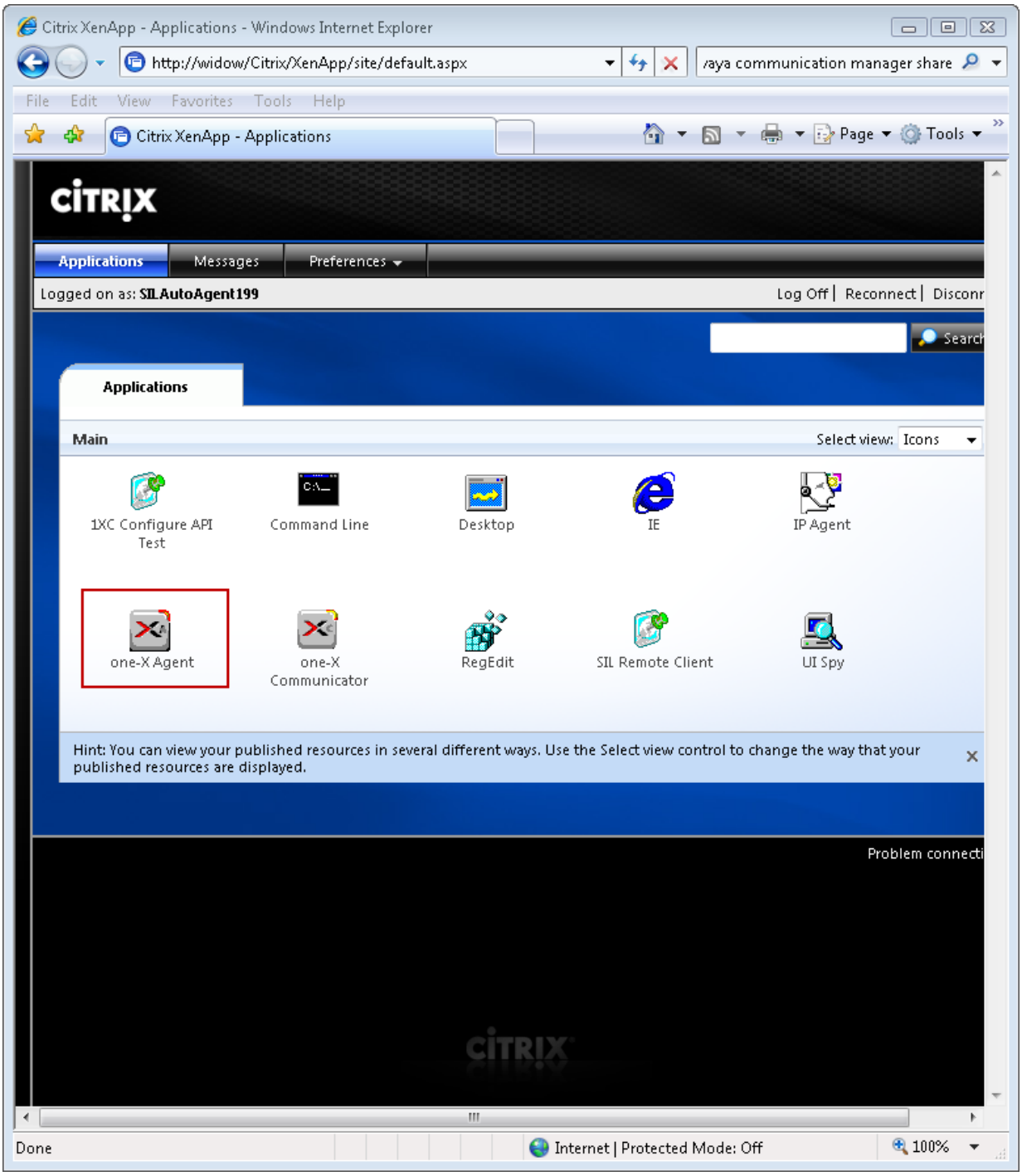
***** The following view is available after login authentication has been completed. Note the published Avaya one-X® Agent Application.



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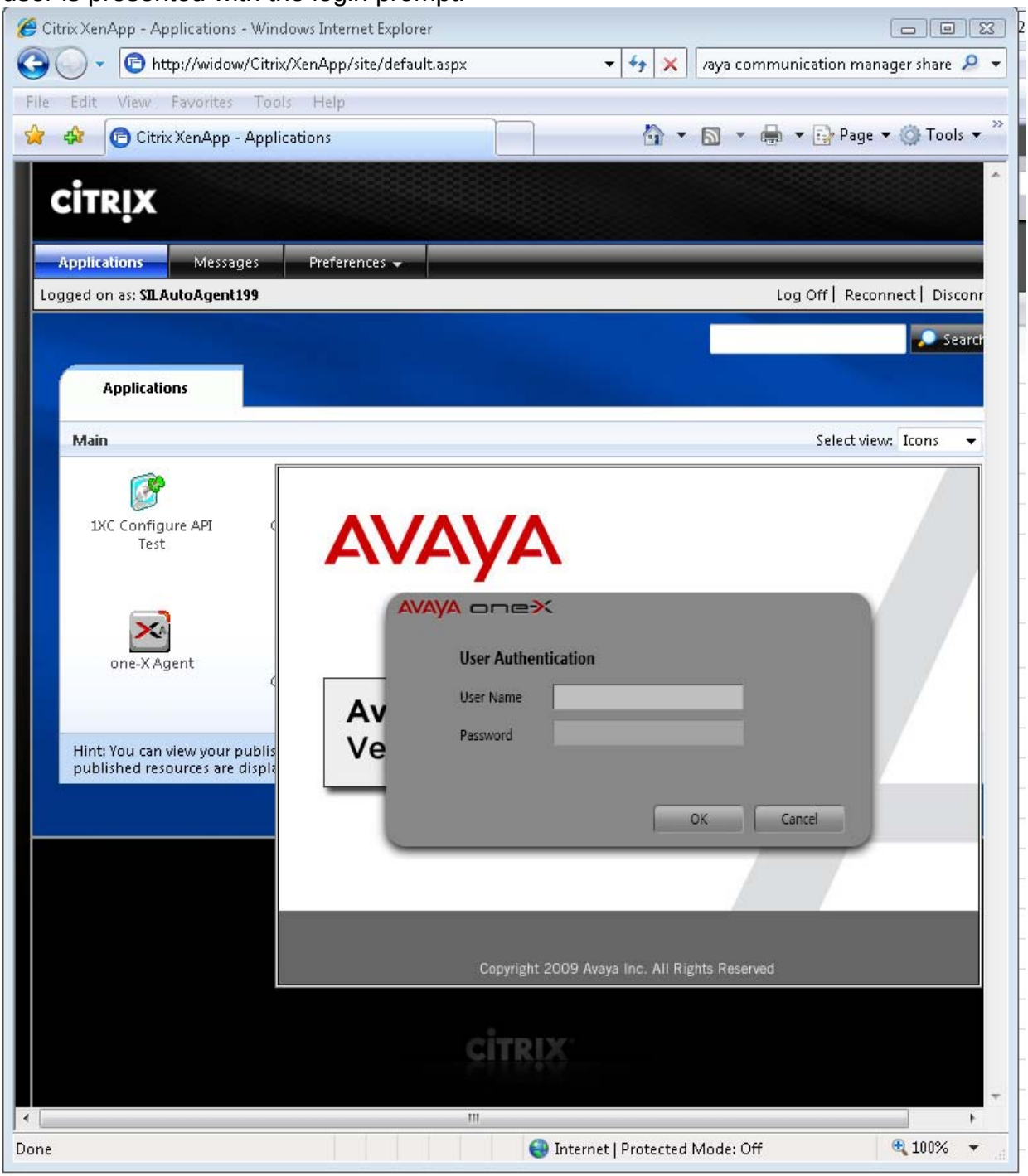
*After selecting the Avaya one-X® Agent Application icon, the application starts and the user is presented with the login prompt.



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*After completing login, the user is presented with the Avaya one-X® Agent application and is able to perform normal agent activities as if the application was installed on his local PC.

4.2. Avaya Aura™ Communication Manager

The test configuration for Call Center Software leveraged many features, including Skills, Queuing, VDNs, Vectors, Variables in Vectors, and UUI. This was intended to provide validation of realistic complex customer scenarios. The reference configuration validated many capabilities and covered many functional aspects of Call Center Software.

5. Test Scenarios

The following section describes the test scenarios, which were designed to provide a reasonable mixture of normal ACD agent activities. The details of each test scenario are outlined with goals for each test sequence. Preliminary testing with Avaya one-X® Agent and the Citrix XenApp™ 5.0 server revealed that the maximum number of agents that the server could manage was 100. Typical ACD call scenarios were utilized to determine impacts on CPU occupancy and RAM utilization.

5.1. Scenario 1 – Basic ACD Call

70 agents were logged in through Avaya one-X® Agent to process typical ACD calls. The details of the basic ACD call scenario are presented below.

Call Scenario: Basic ACD Call

- Calls arrive at a VDN, are queued to a skill, and then delivered to an agent.
- Caller and agent are connected for 3 minutes
- Caller disconnect from agent and agent become available for next call.
- <Repeat>

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5.2. Scenario 2 – Transfer ACD Call

20 agents were logged in through Avaya one-X® Agent to process typical ACD transfer calls. There was essentially no difference in performance for Avaya one-X® Agent to process a blind transfer or a consultative transfer, as the phone interactions are the same. With a blind transfer, Avaya one-X® Agent performs the same functions as a consultative transfer in an automated fashion. The detailed transfer call scenario is presented below.

Call Scenario: Transfer ACD Call

- Agent receives call.
- Agent talks on call for 3 minutes.
- Agent transfers caller to another number (i.e. VDN)
- <Repeat>

5.3. Scenario 3 – Conference ACD Call

10 agents were logged in through Avaya one-X® Agent to process typical ACD conference calls where one agent conferences in another agent. The detailed transfer call scenario is presented below.

Call Scenario: Conference ACD Call

- Agent (1) receives call.
- Agent (1) talks on call for 2 minutes.
- Agent (1) places caller on hold and calls Agent (2)
- Agent (1) talks to Agent (2) for 1 minute
- Agent (1) conferences Agent (2) with caller
- Agent (1), Agent (2), and Caller talk for 3 minutes
- Agent (1) drops all parties
- <Repeat>

6. Results

Testing was performed with and without the Avaya one-X® Agent Central Management capabilities. There was no impact on server performance. The following sections provided detailed measurements obtained during the testing.

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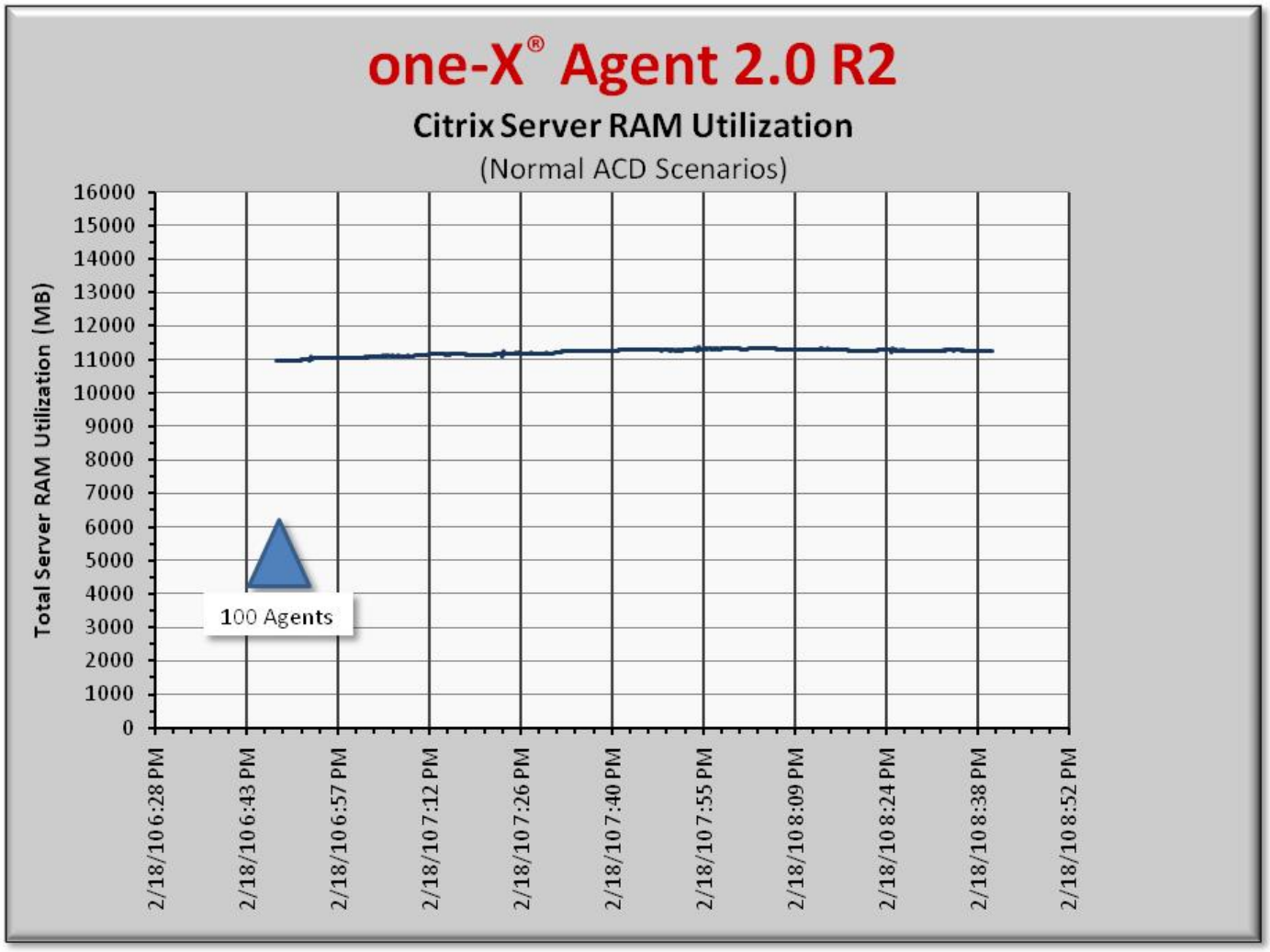
6.1. RAM Utilization

RAM utilization never exceeded the total RAM available in the server. Each Avaya one-X® Agent Citrix session takes ~100MB of RAM.



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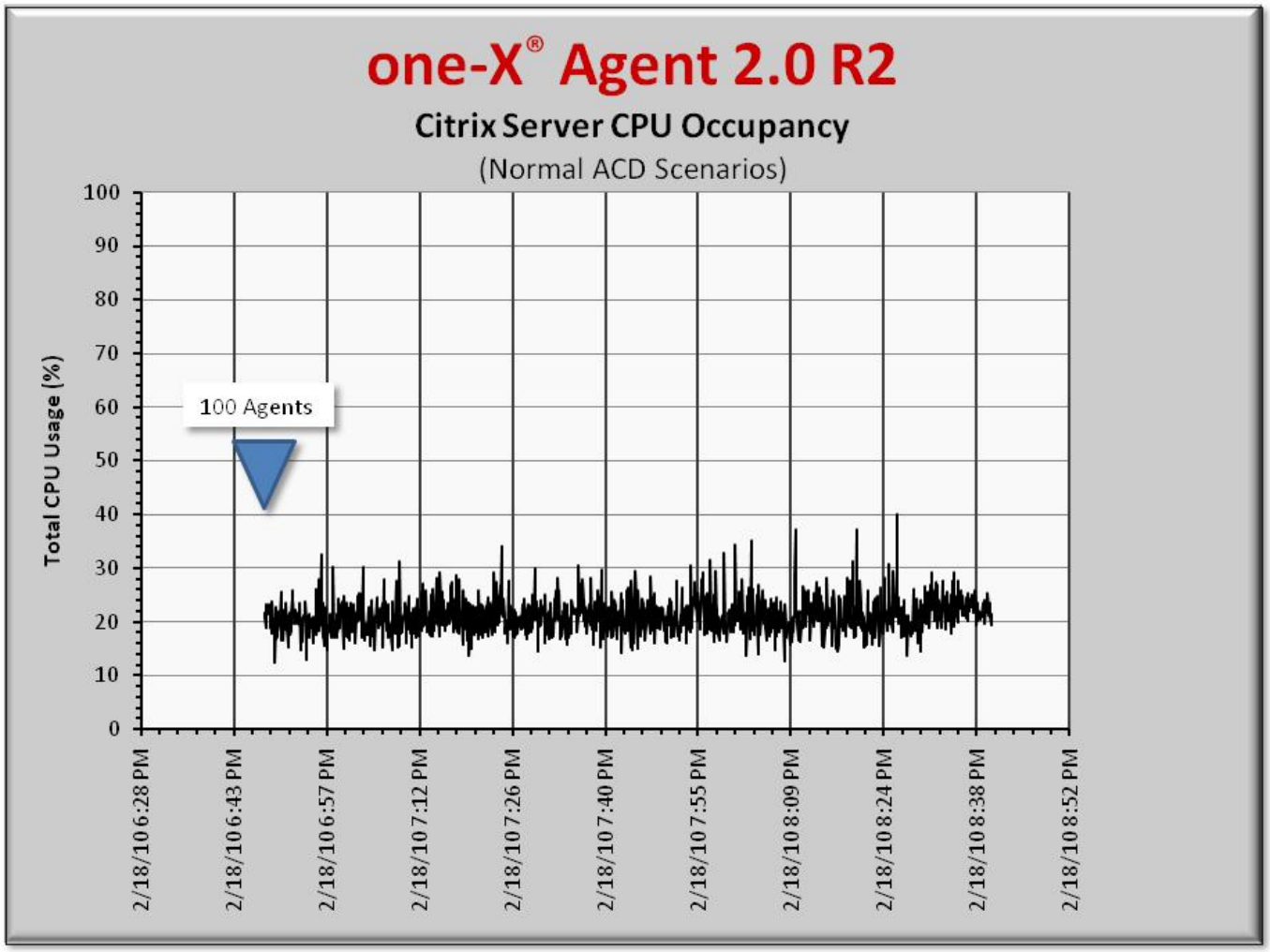
6.2. Processor Occupancy (CPU)

The chart below represents the overall CPU occupancies with 100 agents logged in processing basic ACD calls, transfers and conferences.



6.3. Observations

- Each of the Avaya one-X® Agent applications under a Citrix XenApp™ session requires ~100MB of RAM.
- CPU occupancy with transfers in Other Phone Mode is very similar to transfers with Desk Phone Mode. No difference in performance observed.
- Occasional CPU spikes noted when performing transfers.
- Normal ACD inbound calls require very little CPU processing.

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7. Test Summary and Recommendations for Sizing

The following list provides the key findings and recommendations based on the standard type server platform (see section **Error! Reference source not found.** for server details) hosting Avaya one-X® Agent with Citrix XenApp™ on Windows 2003 server with typical ACD call scenarios.

- The Citrix XenApp™ server can host 100 instances of the Avaya one-X® Agent application with agents processing basic ACD calls, some transfers, and some conferences. Careful attention should be taken to observe call center activities to avoid performance issues when sizing a system.

- Transfer and conference scenarios result in higher CPU occupancy and should be considered when sizing a solution.

- Avoid creating a condition that results in high CPU occupancies (especially above 75%), as this will affect Avaya one-X® Agent application's performance.

- There was no impact on the Citrix XenApp™ server with or without the Avaya one-X® Agent Central Management enabled.

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