

# TRAINER PREPARATION GUIDE 2.3: WORK WITH THE NETWORK

## Lesson Objective 2.3:

Work with the network. *Topics:* set up Web services, TCP, UDP, basic management; plan for areas without access to Internet.

## Required materials to teach this lesson:

1. A workstation with Windows 7®, Windows Vista®, or Windows XP®
2. Microsoft Visual Studio® or Microsoft Visual C# Express® (2008 or 2010)
3. XNA® Game Studio 2.0, 3.0, 3.1, or 4.0
4. Internet access
5. 98-374-ENU-2.3-LP
6. 98-374-ENU-2.3-IC
7. 98-374-ENU-2.3-IC\_Key
8. 98-374-ENU-2.3-PC

## Preparation Tasks

### Technical preparation activities:

1. Preview and be prepared to demonstrate the tutorial, "Creating Your First WCF Service":  
<http://channel9.msdn.com/shows/Endpoint/Endpoint-Screencasts-Creating-Your-First-WCF-Service/>

2. **Vocabulary:**

**datagram:** a packet that carries the source and destination information.

**frame:** a package of information transmitted as a single unit transmitted between two networked points.

**header:** part of the packet that contains information such as its length.

**packet:** a container that carries data over networks.

**Transmission Control Protocol (TCP):** one of the main protocols in a TCP/IP networks. TCP delivers the packets in order and guarantees delivery.

**User Datagram Protocol (UDP):** an Internet protocol that is less reliable and delivers packets in random order.

**Web services:** a modular collection of web protocol-based applications that can be mixed and matched to provide business functionality through an Internet connection.

**Windows Communication Foundation (WCF):** a component of the Microsoft® .NET Framework for building and accessing web services. It allows developers to access data via the web.

3. **Additional readings and resources:**

**MSDN®:**

**Creating Your First WCF Service:** <http://channel9.msdn.com/shows/Endpoint/Endpoint-Screencasts-Creating-Your-First-WCF-Service/>

**Receiving Network Data:** <http://msdn.microsoft.com/en-us/library/bb975894.aspx>

**Windows Communication Foundation:** <http://msdn.microsoft.com/en-us/library/dd456779.aspx>

**Other resources (books, e-reference):**

Cawood, Stephen, and Pat McGee. *Microsoft XNA Game Studio Creator's Guide*. 2d ed. New York: McGraw-Hill, 2009.

**UDP vs. TCP:** <http://gafferongames.com/networking-for-game-programmers/udp-vs-tcp/>

**Instructor computer setup:**

1. Microsoft PowerPoint® with projection system
2. Visual Studio for demonstration purposes
3. Interactive whiteboard (optional)

**Instructional preparation activities:**

1. Review the instructor notes in the notes panels of the Microsoft PowerPoint presentation 98-374-ENU-2.3-LP.
2. Ensure that students are seated in pairs or have pre-assigned partners for the in-class activity.
3. Make copies of student documents available as needed.
4. Read the article for the in-class activity. Be familiar with the "Think-Pair-Share" discussion model suggested in this activity.

**Think:** Each student responds to the first question without consulting anyone else in class. Allow about 2–3 minutes for students to process and record their thoughts.

**Pair:** Next, direct each student to discuss his or her answer with a partner. They can change or add to their responses, then work together to come up additional ideas. For this portion of the activity, allow each pair 2–3 minutes to work.

**Share:** Finally, call on each pair to share their thoughts with the whole class. During this phase, allow the whole group to discuss interesting answers, or answers the group may seem to disagree with. After this discussion, direct students to look over their own responses. Students should add any good examples they heard from other groups. Repeat this process for each discussion question.

**Lesson Sequence (50 minutes)**

**Activating prior knowledge/lesson staging (5 minutes):**

Direct students to answer each question in the "Guiding Questions" section of the In-class Activity document, or in their personal class notes.

**Guiding questions:**

1. **Describe how web services are created in Visual Studio.** Open Visual Studio and select File, Create New Project. Select WCF as Project Type, WCF Library Services to get started.

2. **How can the designer plan for geographic areas that do not have Internet access?** The designer can use a local network and a *PacketReader*.
3. **What types of games typically use TCP and UDP?** Multiplayer action games played in real time typically use UDP because the data is transferred much faster. Single-player games, or multiplayer games in which the users take turns, typically use TCP.

**Lesson activity (40 minutes):**

1. Teacher instruction (15 minutes)  
Use the included PowerPoint presentation to review the topic of working with the network.
2. In-class activity (20 minutes)  
Students are to complete the 98-374-ENU-2.3-IC handout. This activity is a Think-Pair-Share activity. Discuss the results.
3. Post-class activity (5 minutes)  
Provide instruction for the post-class activity as needed.

**Lesson review (5 minutes):**

1. Discuss the guiding questions.
2. Instruct students to write and submit any questions they have or any topics about which they would like more assistance.
3. After class, look through the student responses and follow up with any student requiring additional help.