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Exam: **70-691**

Title : TS: Windows HPC Server 2008, Developing

Version : DEMO

1. You plan to develop a parallel application by using Windows HPC Server 2008.

You plan to use a method to control the calculations performed by each individual process.

You need to ensure that different commands can be sent to each process.

Which function should you use?

A. MPI_Send

B. MPI_Bcast

C. MPI_Gather

D. MPI_Reduce

Answer: A

2. You plan to develop a parallel application by using Windows HPC Server 2008.

You need to implement a method that will send different data to each process in a communicator by using a single call.

Which function should you use?

A. MPI_Send

B. MPI_Gather

C. MPI_Reduce

D. MPI_Scatter

Answer: D

3. You plan to develop a parallel application by using Windows HPC Server 2008.

The application performs the following tasks:

x Performs multistep calculations

x Processes data by using the same code segment that runs on each compute node

You need to ensure that each compute process executes the same step simultaneously.

Which type of communication should you use?

A. Buffered

B. Collective

C. Non-blocking

D. Point-to-point

Answer: B

4. You plan to develop a parallel application by using Windows HPC Server 2008.

You need to ensure that when the application starts, a parameter value is communicated to each process in the cluster by using a single call.

Which function should you use?

A. MPI_Send

B. MPI_Bcast

C. MPI_Gather

D. MPI_Reduce

Answer: B

5. You plan to develop a single program multiple data (SPMD) application by using Windows HPC Server 2008.

You use multiple processes to perform intermediate calculations and to provide the results as a single number.

You need to ensure that the intermediate results are collected and added together by using a single MPI function.

Which function should you use?

A. MPI_Send

B. MPI_Bcast

C. MPI_Gather

D. MPI_Reduce

Answer: D

6. You develop a parallel application that will be deployed on a Windows HPC Server 2008 cluster.

You write the following code segment. (Line numbers are included for reference only.)

```
01  int rank;
02  MPI_Comm_rank(MPI_COMM_WORLD, &rank);
03  // declaration of variable hostName
```

```
04    // code to execute
05
06    std::cout << "hostname of rank " << rank;
07    std::cout << ": " << hostName << "\n";
```

You need to ensure that a variable named hostName contains the name of the cluster node that the code runs on.

Which code segment should you add at line 05?

A.
```
char *hostName = getenv("MPI_HOSTNAME");
```

B.
```
char hostName[MPI_MAX_PROCESSOR_NAME];
int resultlen;
MPI_Get_processor_name(&resultlen, hostName);
```

C.
```
char hostName[MPI_MAX_NAME_STRING];
int resultlen;
MPI_Comm_get_name(MPI_COMM_WORLD, hostName, &resultlen);
```

D.
```
char hostName[256];
int resultlen = sizeof(hostName);
if (rank == 0)
{
   gethostname(hostName, resultlen);
}
```

Answer: B

7. You develop a parallel application that will be deployed on a Windows HPC Server 2008 cluster.

You write the following code segment. (Line numbers are included for reference only.)

```
01    MPI_Init(&argc, &argv);
02
03    {
04       // program part for rank 0
05
06    }
```

```
06    else
07    {
08        // program part for all other ranks
09    }
10    MPI_Finalize();
```

You need to ensure that the code in the rank 0 section only executes on the process that has a rank of 0.

Which code segment should you insert at line 02?

A.
```
int size;
MPI_Comm_size(MPI_COMM_WORLD, &size);
if (size > 0)
```

B.
```
int size;
MPI_Comm_size(MPI_COMM_WORLD, &size);
if (size == 0)
```

C.
```
int rank
MPI_Comm_rank(MPI_COMM_WORLD, &rank);
if (rank == 0)
```

D.
```
char hostName[MPI_MAX_PROCESSOR_NAME];
int resultlen;
MPI_Get_processor_name(hostName, &resultlen);
char masterName[] = "rank0";
if (strcmp(masterName, hostName) != 0)
```

Answer: C

8. You develop a parallel application that will be deployed on a Windows HPC Server 2008 cluster.

The application uses point-to-point communication.

The process that has a rank 0 sends an array of integer values to the rank 1 process by using the following code segment. (Line numbers are included for reference only.)

```
01    int values[5];
02    MPI_Send(values, 5, MPI_INT, 1, 42,
03      MPI_COMM_WORLD);
```

You need to ensure that each receiving process is able to correctly receive the values in the most efficient manner possible.

Which code segment should you use?

A. int values[5];

int buffer[5];

MPI_Reduce(buffer, values, 5, MPI_INT, MPI_SUM, 1, MPI_COMM_WORLD);

B. int values[5];

MPI_Status status;

MPI_Recv(values, 5, MPI_INT, 0, 42, MPI_COMM_WORLD, &status);

C. int value;

MPI_Status status;

MPI_Recv(&value, 1, MPI_INT, 0, 42, MPI_COMM_WORLD, &status);

D. int values[5];

MPI_Status status;

MPI_Recv(values, sizeof(int), MPI_INT, 0, 42, MPI_COMM_WORLD, &status);

Answer: B

9. You develop a parallel application that will be deployed on a Windows HPC Server 2008 cluster.

You write the following code segment that computes an approximation to Pi. (Line numbers are included for reference only.)

```
01    static int totDarts = 10000;
02    int numDarts = 0;
03
04    MPI_Comm_size(MPI_COMM_WORLD, &commSize);
05    MPI_Comm_rank(MPI_COMM_WORLD, &commRank);
06
07    for(i = 0; i < totDarts; i++) {
08        x = 2 * (randomNr() - 0.5);
09        y = 2 * (randomNr() - 0.5);
10        if (x*x + y*y <= 1.0)
```

```
11        ++numDarts;
12    }
13
14    if(commRank == 0) {
15        pi = 4 * total/(commSize * totDarts);
16        printf("Pi = %d\n", pi);
17    }
```

You need to ensure that the total number of numDarts is only available on the process that has a rank 0.

Which code segment should you insert at line 13?

A. MPI_Reduce(&numDarts, &total, 1, MPI_INT, MPI_SUM, 0, MPI_COMM_WORLD)

B. MPI_Allreduce(&total, &numDarts, 1, MPI_INT, MPI_SUM, MPI_COMM_WORLD)

C. MPI_Gather(&numDarts, 1, MPI_INT, &total, 1, MPI_INT, 0, MPI_COMM_WORLD)

D. MPI_Allgather(&numDarts, 1, MPI_INT, &total, 1, MPI_INT, MPI_COMM_WORLD)

Answer: A

10. You plan to develop a Microsoft Message Passing Interface (MPI) application by using Microsoft Visual Studio.

You have installed the Microsoft HPC Pack 2008 SDK at C:\Program Files\Microsoft HPC Pack 2008 SDK.

You create a new console application.

You need to ensure that the application compiles for a 64-bit architecture.

Which two tasks should you perform? (Each correct answer presents part of the solution. Choose two.)

A. Set the Import Library property to msmpi.lib.

B. Set the Additional Dependencies property to msmpi.lib.

C. Set the Additional Library Directories property to C:\Program Files\Microsoft HPC Pack 2008 SDK\lib\amd64.

D. Set the Additional Manifest Dependencies property to C:\Program Files\Microsoft HPC Pack 2008 SDK\lib\amd64.

Answer: BC

11. You develop a parallel application by using Microsoft Visual Studio 2008.

You have installed the Microsoft HPC Pack 2008 SDK at C:\Program Files\Microsoft HPC Pack 2008 SDK.

You create a new console application based on Microsoft Message Passing Interface (MPI). You set the Debugger to Launch property to MPI Cluster Debugger.

You need to ensure that five processes are launched when the application is run in debug mode in Visual Studio 2008.

Which two tasks should you perform? (Each correct answer presents part of the solution. Choose two.)

A. Set the MPIRun Arguments property to -n 5.

B. Set the Application Arguments property to -n 5.

C. Set the MPIRun Working Directory property to C:\Program Files\Microsoft HPC Pack 2008 SDK\bin.

D. Set the MPIRun Command property to C:\Program Files\Microsoft HPC Pack 2008 SDK\bin\MPIExec.

E. Set the Application Command property to C:\Program Files\Microsoft HPC Pack 2008 SDK\bin\MPIExec.

Answer: AD

12. You create a parallel application by using Microsoft Visual Studio 2008.

The application prints a message to the console of all Microsoft Message Passing Interface (MPI) processes except for one. The application terminates and displays an error message.

You need to change the code in the application so that the application completes successfully.

Which set of tasks should you include in the application?

A. Include mpi.h

Link to msmpi.lib

Call MPI_Start

Call MPI_Comm_rank

Call MPI_Finalize

B. Include mpi.h

Link to msmpi.lib

Call MPI_Init

Call MPI_Comm_rank

Call MPI_Finalize

C. Include mpi.h

Link to ccpapi.tlb

Call MPI_Init

Call MPI_Comm_rank

D. Include mpi.h

Link to msmpi.lib

Call MPI_Init

Call MPI_Comm_size

Answer: B

13. You plan to create a parallel application by using Microsoft Visual C++.

You want to use the Microsoft Message Passing Interface (MPI) library in the application.

You need to ensure that the application can be compiled for both 32-bit and 64-bit platforms. You also need to ensure that targeting both platforms requires minimum maintenance.

What should you do?

A. Create a separate project for each platform.

B. Create separate solution files for each platform.

C. Create separate custom build rules for each platform.

D. Create a separate build configuration for each platform.

Answer: D

14. You create a Microsoft Message Passing Interface (MPI) application by using Microsoft Visual Studio 2008.

The application process is named MPIApplication.exe. You plan to debug the application by using the MPI Cluster Debugger in Visual Studio 2008.

You need to attach the debugger to the remote process on a compute node.

Which process should you attach to?

A. smpd.exe

B. mpiexec.exe

C. msvmon.exe

D. MPIApplication.exe

Answer: C

15. You create a Microsoft Message Passing Interface (MPI) application by using Microsoft Visual Studio 2008.

You plan to debug the application by using Visual Studio 2008.

You need to configure the nodes that will be used for debugging.

What should you do?

A. Use the Cluster Debugger Configuration tool in Visual Studio.

B. Use the debugging pane in the Visual Studio project property pages.

C. Use the configuration pane in the Cluster Administration Console tool.

D. Use the node management pane in the Cluster Administration Console tool.

Answer: A