New Enterprise Cloud Servers
By Jaqui Lynch

Introduction

On September 19, 2016 IBM announced its new Enterprise Cloud Servers, the E870C and the E880C. Both of these systems come with OpenStack based cloud management and open source automation software which provides for both flexibility and faster adoption of cloud infrastructures. Additionally, the purchase of an E870C or E880C includes 12 months of complimentary use of POWER8 servers running Ubuntu Linux in the Dallas SoftLayer data center.

Hardware

The E870C and E880C are modular systems. The E870C is either one or two nodes and the E880C is one, two, three or four nodes. Each node is 5U in a 19" rack along with an additional 2U SCU (system control unit). The SCU provides redundant functionality such as redundant system clocks and service processors along with the operator panel and the base DVD. The DVD is optional but I highly recommend you include it. The SCU provides redundancy even when there is only one node installed. The SCU also provides connections to up to two HMCs (hardware management consoles) using 1Gb RJ45 networking. At least one HMC or a virtual Appliance HMC is required for the E870C and E880C. There are specific requirements around minimum hardware and software levels for the HMCs. IVM (integrated virtualization manager) is not supported instead of an HMC. The HMC will also require additional memory if you need to support more than 254 partitions so this may be a good time to buy a new HMC and add memory to it.

There are four main building blocks in an E870C or E880C system – the SCU, the system node, the PCIe Gen3 I/O expansion drawer (for cards) and the EXP24s SFF Gen2 I/O drawer for disks. Each system node has four sockets for POWER8 processors. All processors in the nodes must be the same size and speed. On the E870C, each processor socket contains an 8 core 4.02ghz processor so a single node can be up to 32 cores with a two node E870C having up to 64 cores. The E880C scales up to 16 sockets where each socket contains either an 8 core 4.35ghz, 10 core 4.19ghz or 12 core 4.02ghz POWER8 processor. A fully configured four node E880C can scale to 128, 160 or 192 cores depending on the base processors in the sockets.

Each node contains 32 CDIMM slots across 8 memory features. The largest memory feature is 1024GB which allows a single node to support up to 8TB of memory. So a two node E870C could support up to 16TB of memory. The E880C scales up to 32TB of memory with four nodes.

Each system node includes eight PCIe Gen3 x16 low profile slots. Additional slots can be made available by adding an EMX0 19" PCIe Gen3 I/O drawer which is 4U and provides an additional 12 PCIe Gen3 slots. It is possible to buy

just one fanout module for the drawer to add only 6 slots rather than 12. The drawer attaches to the server using a pair of optical cables, which take up two slots in the system node. Up to 4 of these I/O drawers can be added per system node. The system nodes do not have any disk bays so disks are added using the EXP24S SFF Gen2 drawer which connects to a SAS adapter in the system node or I/O drawer. The EXP24S is the only supported disk drawer for the E870C and E880C.

Because of the amount of power used by the new servers IBM has brought out new PDUs that can be used in the IBM 7014-T00, 7014-T42 and 7965-94Y racks. The new PDUs are intelligent PDUs that provide more power and that offer advanced functions such as remote power on and off. It should also be noted that only horizontal PDUs can be used in a rack that contains E870C and E880C systems. Attention needs to be paid to power requirements and PDU rules. I highly recommend going with 60amp PDUs if possible otherwise you will find you are very limited in what you can connect to each PDU and you will require significantly more PDUs. As an example each system node can use up to 4.2Kva and a 24 amp PDU can only support up to 4.8Kva. For redundancy you need two per system node which means that a 2 node E870C would require 4 x 24 amp PDUs just for the 2 nodes

Both systems come with a number of enterprise options such as mobile activations along with various capacity on demand options. A minimum of 8 cores must be active and 50% of the memory must be active so there is incredible flexibility that allows you to plan for growth and varying workloads.

Software

So what makes this different from the E870 and E880 that are already available. The answer is in the software. Both systems come with the cloud management software and services to help with the move to cloud, whether it be a private or hybrid cloud environment. IBM has combined software and services offerings that make it much easier to migrate and manage a cloud environment.

PowerVC Cloud manager is used to provide for the management of resources including the provision of a self-service portal for end users along with policies that enforce rules around resource allocation, security and other areas. PowerVC Cloud manager provides the ability to create and modify VMs and their attached resources, along with the ability to monitor and report on usage. It can manage AIX, IBM i and Linux VMs running under PowerVM as well as Linux VMs running under PowerKVM.

IBM is also proving an HMC Apps as a service which allows you to aggregate your performance, auditing and inventory data for the enterprise on a hosted system. The HMC provides the data to the hosted system and access is provided through a secure portal to the reports. This service is free of charge to

those buying E870C and E880C servers and requires that the HMC be at the 8.8.6.0 level or higher.

Additional software provided includes software to support Open source cloud automation and configuration tooling for AIX. Packages include CHEF, YUM, Cloud-Init, GitHub and Node.js. IBM's API Connect and Websphere connect can be used to securely connect system of record workloads with cloud based workloads – there are IBM Power to Cloud services offered to enable rapid deployment.

Extras

As an extra incentive to those who purchase an E870C or E880C offering, IBM is including entitlement to one year of a POWER8 Linux bare metal system in the IBM Cloud (SoftLayer®). Specifically, access is provided to a POWER8 Linux system with 10 x 3.49ghz cores, 256GB memory, 2 x 4TB disks and Ubuntu Linux. This makes for a great development environment for new applications or for testing.

Lastly, IBM has created a Power to Cloud Rewards program. This is a transformation of the PowerCare program into a points based rewards system. Those points can then be used to take advantage of multiple services offerings including various design and/or build service from IBM for cloud environments. This includes a Design for Hybrid Cloud workshop along with many other workshop offerings.

Summary

As we migrate further into the world of cloud it is apparent that integration and management of the environments is a key issue. The way that IBM has packaged the E870C and E880C with cloud management software and the necessary services to help clients move rapidly to cloud will make a significant difference to the speed and success of cloud deployments. The workshops being provided under the Power to Cloud Rewards program further ensure that the transition is not only successful, but also that your employees are educated in the area and able to support it moving forward.

References

E870C and E880C Technical Overview
http://www.redbooks.ibm.com/redpieces/pdfs/redp5413.pdf

Enterprise Cloud Servers Home Page
http://www-03.ibm.com/systems/power/hardware/enterprise-cloud/