



PAUL CLIFTON
Senior Systems & Storage Engineer
Openstack / VMware / Linux / UNIX
Administrator
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MAJOR ACCOMPLISHMENTS

- Manage **Netapp Storage** including Solidfire for block and NAS FAS series for file.
 - Work product examples: <https://github.com/pctexican>
- Lead architect to migrate over 500TB of SAN Data residing on IBM: XIV, DS8000 and EMC: VMAX, Symmetrix, DMX, CLARiiON to a new data center.**
- Infrastructure Architect and Technical Team Lead to implement IBM STORAGE SVC (SAN Volume Controller) into existing SAN infrastructure.
- Used ANSIBLE to automate the installation of CEPH.** Reduced installation time from 1 week to 4 hours.
- Achieved the highest IBM AIX certification offered: C.A.T.E. (Certified AIX Technical Expert).
- Invited by IBM to Co-author book on SAN Storage:**
<http://www.redbooks.ibm.com/redbooks/pdfs/sq246422.pdf>
- Configured RSYNC between AIX servers and a centralized Windows server to constantly sync logs.** This allows contractors to view server logs without needing accounts on the UNIX servers which is more secure and saves a lot of time for System Administrators.

CERTIFICATIONS

- Openstack Certified Administrator Professional Level:**
<https://training.mirantis.com/verify/certificate/status/-1-A9Q480CsRXA7ExqnKFw/200-704-327>
- DellEMC Transcripts:**
<https://www.certmetrics.com/dell/public/transcript.aspx?transcript=D8XQG34C1N4E1SCL>
- EMC **Cloud Architect: IT-as-a-Service Expert (EMCCAE)** - January 2016
- EMC **Cloud Architect: Virtualized Infrastructure Specialist** - Nov 2015
- EMC **Cloud Infrastructure and Services Associate (EMCCIS)** - June 2015
- ViPR SRM 3.x Storage Resource Management - Dec 2015
- EMC Information Storage Associate (EMCISA) - May 2015
- Brocade Certified Fabric Professional - July 2002
- McData Certified Storage Network Implementer - June 2002
- IBM Certified Advanced Technical Expert- RS/6000 AIX - March 2002
- IBM Eserver Certified Systems Expert - pSeries HACMP for AIX - March 2002
- IBM Eserver Certified Specialist - AIX 5 for IBM eserver pSeries System Support - March 2002
- IBM Eserver Certified Specialist - AIX 5 for IBM eserver pSeries System Administrator - March 2002
- IBM Certified Specialist - AIX Communications - March 2002

PROFESSIONAL EXPERIENCE

INOVA, Remote from home in San Antonio, TX

June 2020 – Present

Storage Engineer / Focus on SAN Storage: NETAPP & DelleMC, Backups, Cisco & Brocade SAN

- **Design / build / administer iSCSI and FC SANs.**
- **Provision Block and NFS-CIFS**
- Lead huge data migration projects from Netapp to DELL/EMC Isilon including CIFS and NFS.
- Recent hands-on experience with storage arrays from multiple vendors including **VMAX, Isilon, & Netapp**
- Improved environment by enabling jumbo frames, lan free backups, incremental copies instead of full.
- Improved data protection by implementing snapshots on the Isilon storage systems.

DXC (Formerly Computer Science Corporation), Austin, TX

Mar 2014 – June 2020

Storage Engineer / Focus on SAN Storage: NETAPP & DelleMC, Backups, Openstack

- **Design / build / administer iSCSI and FC SANs.**
- **Provision Block, NFS-CIFS, & Object-based storage.**
- Recent hands-on experience with storage arrays from multiple vendors including:
 - Dell/EMC Powermax 2000 & 8000, Isilon, VMAX, VNX, Unity 600 series
 - IBM XIV, V7000
 - **Netapp AFF A700 A800, FAS8200, FAS8060, FAS6250**
 - Nimble CS700
 - Solidfire (NETAPP) ALL Flash SF19210, SF9605
 - SAN Switches from Arista, Brocade, and CISCO
- **Netapp resident for Juniper**
 - Experience with Netapp OnCommand Unified Manager 9.
 - Fixed storage issues with Kubernetes / Trident using Netapp backend.
 - Fixed Solidfire performance issues- replacing nodes, upgrading firmware, network improvements
 - Created weekly performance and capacity reports of storage systems.
- **SOLIDFIRE:**
 - Work product examples: <https://github.com/pctexican/SOLIDFIRE>
 - tuned for better IO performance (QoS settings, Qdepth on hosts, Jumbo frames)
 - implemented Python scripts to set QoS settings, pull performance info into Grafana
- **Configured replication** across Dell/EMC VMAX storage systems using SRDF.
- **Performed upgrades on storage systems** including Dell/EMC PowerMax, VNX, Isilon, Unity, Dell Compellent; IBM XIV, DS7000; **Netapp Solidfire SF19210**; Nimble CS700.
- **Allocate storage for Linux, Windows, VMware, Oracle RAC, VDI, & Openstack environments.**
- Performed storage benchmarks comparing DELL Compellent, Nimble, PURE, & vSAN.
- **Automate system administration tasks using Ansible for LINUX servers** (RHEL and CentOS).
- **Installed and managed 14 all-flash Netapp Solidfire storage clusters, mostly SF19210s.**
- The architect for Cloud Labs team; responsible for Openstack, SAN Storage, NETAPP NAS, CIFS, Backups (Simpana Commvault & Netbackup), CISCO UCS, DELL FLEX system, and Monitoring & Alerting using Netbrain and Solarwinds.
- Upgraded Simpana Commvault from version 10 to 11.

- Manage CINDER / SWIFT / GLANCE / CEPH / RadosGW for Red Hat Openstack. (RHOSP)
- Architect / Build / Maintain Solidfire storage clusters for Openstack cinder storage.
- Built large-scale CEPH clusters which require over 10GB/sec write perf.
- Create RAID/storage groups, volumes, LUNs, and provision storage resources to Windows, UNIX, ESX VMware hosts.
- Implemented CDP (Continuous Data Protection) using snapshots on Nimble storage.
- Administer Simpana Commvault SW on DELL Powervault HW.
- Architect / Build / Administer Enterprise SAN storage solutions.

SAN Storage Solutions, Inc. Dallas, TX

Oct 2002 – Mar 2014

Storage Architect / AIX Administrator- Consultant

- Provide consulting services on SAN Architecture, Storage and Server Virtualization, Data Center Migration, and Disaster Recovery
- Provide SAN Management services; **experienced with CISCO MDS** and Brocade SAN switches
- Completed a successful implementation of **EMC Replication Manager** for a client enabling **LIVE** backup of Oracle Databases.

Client Work History

o Technology Service Partners	Oct 2002 - Feb 2006
o IBM SAN Residency (5 weeks)	Feb 2003 - Mar 2003
o EMC Resident- ERCOT (Electric Reliability Council of Texas)	Apr 2006 - Sep 2006
o Dr. Pepper Snapple Group	Sep 2006 - Jan 2007
o EMC Resident- ERCOT	Jan 2007 - April 2008
o Dr. Pepper Snapple Group	May 2008 – Mar 2009
o University Health Systems	Jan 2009 – Mar 2009
o UCSF (University of California San Francisco)	Jun 2009 - Jun 2011
o Comcast	Jul 2011 - Feb 2014

- Experienced with many storage vendors including EMC (VMAX, DMX, CX), IBM (XIV, DS, ESS), Hitachi, & HP.
- **Create SYMCLONE / SYMSNAP solutions for EMC customers for hot (live) database backups.**
- Created a "wwn" script to report which SAN switch/port a server/HBA is connected to. SAN info is updated daily via FibreZone to pull data from the McData Directors and SSH to pull data from CISCO Directors.
- Implemented SAN boot for over 200 AIX servers with FAILOVER and load-balancing for the OS.
- Created an EMC I/O monitoring tool called "**emc_iostat**" which displays read/write speeds and transaction sizes in real time.
- **Wrote several scripts to automate storage allocation using ESSCLI and SYMCLI.**
- Implemented ECC to handle Zoning, LUN masking, clones, snapshots, and performance monitoring.
- Lead a project to migrate 16TB of data from **ESS to DMX** for 6 servers ONLINE using host-based migration (migratepv/mirrorvg).
- Optimized disk storage for UDB, DB2, & Oracle databases. **Increased sequential read speeds from 30 to 200MB/sec using the same hardware.**
- Implemented a WIKI server (easily modified web pages without HTML) for the UNIX, DBA, Storage teams to easily document procedures.

IBM International Technical Support Organization (ITSO) Almaden Research Center - San Jose, California

Feb 2003 - Mar 2003

IT / Storage Specialist

- **Selected by IBM (less than 2% of authors are selected outside of IBM)** to participate in the IBM residency program to write an IBM Redbook on tuning SAN Storage.
- Worked with a team of 5 to produce the "IBM ESS Model 800 Performance Monitoring and Tuning Guide".
- Duties include testing the ESS for Open Systems performance and reporting on the effects of striping data at both the Operating System level and across disk components internal to the ESS.
- **Wrote scripts (Korn Shell, AWK, Perl) to monitor I/O performance on AIX, HP-UX, and SUN Solaris which are published in the book.**

Valero Energy Corporation, San Antonio, TX

Oct 2000 - Sep 2002

Lead Technical Specialist

- Increased TSM backup speeds from ESS to 3590 Tape from 120GB/hour to 400GB/hr using the same HW.
- Optimized the Oracle Database filesystems for SAP production servers improving sequential read performance from 30 to 140MB/sec.
- Wrote a SAN Performance tool called ESS-IOSTAT to report SHARK performance and provide functionality not available from any IBM product.
- Configured HACMP cluster of S80 nodes for mutual takeover. Responsible for failover testing and performance tuning.
- Maintained 20 AIX Servers (S80, M80, pSeries, 39H) / SHARK ESS / McData ED-5000, ED-6064, ES-1000.

ZEPHYR Technologies Monterrey, Mexico

February 1999 - September 2000

Computer Engineer

- Architected web portal for zephyrtechnologies.com
- Installed LAN/WAN connectivity for Monterrey and Guadalajara offices.
- Manufacturer's rep for EPSON, Chantworld, ParaLight, Shinano Kenshi, and Senior Technologies.
- Representative for America II; electronic components distribution.

IBM Advanced Workstation Division (Keane Consultant) Austin, Texas August 1996 - Jan 1999

AIX Consultant/ Level II Support

- Successfully completed the highest performing IBM Lotus Notes benchmark to date- 28,800 email users with 200 millisecond response time.
- Skills included automating the install of AIX and Lotus Notes on 70+ servers; configuration of SSA drives and TCP/IP.

American College Testing Iowa City, Iowa

July 1995 - August 1996

UNIX and ORACLE Systems Administrator

- Fixed a remote NFS transfer problem by adjusting memory buffers avoiding the re-write of over 100 programs.
- Responsible for 20+ Systems including, RS/6000, AT&T, NCR, SUN, and VAX servers supporting over 150 ORACLE users and programmers.

IBM Advanced Workstation Division (Consultant) Austin, Texas

January 1990 - July 1995

AIX Support Line Analyst

- Provided technical support for IBM System Engineers and customers using the RISC System/6000.
- Responsible for Kernel, Storage, Printers, TCP/IP, SLIP communications, SW Installation, and HW configuration issues.

- Used AFS/DFS and CMVC to track test cases and code changes.

EDUCATION

The University of Texas at Austin, B.S., Electrical Engineering

Graduated Dec 1992

- Course work included: data structures in C, C++, microprocessor programming and applications, electronic circuit design labs, electromagnetics, control theory, the study of the electrical properties of materials and devices, and power systems.

Openstack /UNIX / SAN Administration

- ❖ **Netapp ONTAP Cluster Fundamentals CDOT Course - June 2019**
- ❖ **VMware VSP - January 2016**
- ❖ **Mirantis OpenStack Accelerated Bootcamp with Exam (OS250) - January 2016**
- ❖ EMC IT As A Service Planning and Design Course - November 2015
- ❖ EMC Information Storage and Management Course - June 2015
- ❖ EMC Cloud Infrastructure and Services Course - June 2015
- ❖ EMC VPLEX Fundamentals - 2015
- ❖ EMC Symmetrix VMAX course - 2015
- ❖ ITIL Training - 2015
- ❖ Nimble Storage University - June 2015
- ❖ Red Hat Openstack Administration Course CL210 - 2015
- ❖ EMC VNX Unified Storage - 2014
- ❖ EMC ViPR SRM 3.x Storage Resource Management Course - 2014
- ❖ EMC ViPR Fundamentals - 2014
- ❖ **VMware training - 2014**
- ❖ IBM SVC San Volume Controller training- June 2013
- ❖ CISCO Networking Essentials - March 2011
- ❖ IBM pSeries P7 Administration - July 2010
- ❖ EMC Replication Manager - Nov 2009
- ❖ Websphere 6.5 Administration Course – April 2009
- ❖ **CISCO MDS-9000 Configuration & Troubleshooting (www.FireFlycom.net\classes\MDSCT) – Aug 2005**
- ❖ IBM SVC Training – July 2005
- ❖ Brocade SAN Fabric Professional 2G Course – July 22-26, 2002
- ❖ S.N.I.A. (Storage Networking Industry Association) Backup & Restore Workshop - February 2002
- ❖ AIX HACMP System Administration II- Problem Determination Course - May 2001