



Solution Brief

Automate Storage Management with Element Software

Eliminate error-prone manual tasks and thousands of scripts with full-featured APIs

Key Benefits

- Minimize development time and overhead with SDK integrations that plug-in and manage seamlessly
- Eliminate thousands of error-prone scripting and code lines with APIs
- Accomplish more faster with SDK's full storage functionality automation

The days of being held back by limited legacy storage allocation practices or hindered by impossible-to-maintain management workflows are over. With a full-featured API, NetApp® SolidFire® puts our entire all-flash, scale-out storage system at your fingertips for complete, robust integrations. The right storage infrastructure can help you think “up the stack” when optimizing your applications and workloads. The right storage APIs enable you to automate “down the stack.” With NetApp SolidFire, APIs are simply the beginning. Now, all complex management tasks can be abstracted from users, making storage an easily programmable resource and thereby increasing your capabilities and driving your business.

You Can Consume Standard Tools

The deep integration of SolidFire with industry-leading virtualization and cloud platforms helps minimize your development time and overhead, enabling more complete and agile solutions. Standard tools and integrations coupled with ecosystem plug-ins make direct management seamless. And leveraging the SolidFire full-featured software development kits (SDKs) simplifies future integrations.

ECOSYSTEM CONNECTIVITY			
VMWARE	DOCKER	OpenStack	CloudStack
TOOLS AND INTEGRATION			
Windows Linux Docker MacOS	Device Agent	Native QoSSIOC	

SDKs Make API Consumption Easy

SolidFire Element® SDKs and tools facilitate full automation and simplify integration of SolidFire features into existing tools, helping you accomplish more, faster.

SDKs		
Python	Java	C++

Robust APIs Control All Features

SolidFire Element was built from the ground up to provide a complete API, putting all storage features and functionality at your fingertips. The API eliminates error-prone manual tasks and troublesome scripting hacks, and builds an unrivaled foundation for scaled automation.

FULL-FEATURED API	
Quality of Service	
Tenant VLANs	Group Snapshots
Clone	Replication

```

BEFORE SDK

public static long createSolidFireVolume(SolidFireConnection sfConnection, String strSFVolumeName, long lSFAccountID, long lTotalSize,
boolean bEnableS12e, Map<String, String> mapAttributes, long miniops, long maxiops, long bursttops)
{
    JSONObject volumeToCreate = new JSONObject();
    volumeToCreate.addProperty("method", "CreateVolume");

    JSONObject params = new JSONObject();
    volumeToCreate.add("params", params);

    params.addProperty("name", strSFVolumeName);
    params.addProperty("accountId", lSFAccountID);
    params.addProperty("totalSize", lTotalSize);
    params.addProperty("enableS12e", bEnableS12e);

    JSONObject qos = new JSONObject();
    params.add("qos", qos);

    qos.addProperty("minIOPS", miniops);
    qos.addProperty("maxIOPS", maxiops);
    qos.addProperty("burstIOPS", bursttops);

    if (mapAttributes != null && mapAttributes.size() > 0) {
        JSONObject attributes = new JSONObject();
        params.add("attributes", attributes);
        Iterator<Map.Entry<String, String>> itr = mapAttributes.entrySet().iterator();
        while (itr.hasNext()) {
            Map.Entry<String, String> pair = itr.next();
            attributes.addProperty(pair.getKey(), pair.getValue());
        }
    }

    final Gson gson = new GsonBuilder().create();
    String strVolumeToCreateJson = gson.toJson(volumeToCreate);
    String strVolumeCreateResultJson = executeJsonRpc(sfConnection, strVolumeToCreateJson);
    VolumeCreateResult volumeCreateResult = gson.fromJson(strVolumeCreateResultJson, VolumeCreateResult.class);
    verifyResult(volumeCreateResult.result, strVolumeCreateResultJson, gson);
    return volumeCreateResult.result.volumeID;
}

```

```

WITH SDK

public static long createVolume(SolidFireConnection sfConnection, String volumeName, long accountId, long totalSize,
boolean enableS12e, Map<String, String> mapAttributes, long miniops, long maxiops, long bursttops) {
    CreateVolumeRequest request = CreateVolumeRequest.builder()
        .name(volumeName)
        .accountId(accountId)
        .totalSize(totalSize)
        .enableS12e(enableS12e)
        .optionalAttributes(convertMap(mapAttributes))
        .optionalQos(new QoS(Optional.of(miniops), Optional.of(maxiops), Optional.of(bursttops), Optional.EMPTY_LONG))
        .build();
    return getSolidFireElement(sfConnection).createVolume(request).getVolumeID();
}

```

Figure 1) Eliminate hundreds of lines of code.

Creating a Volume for CloudStack

SolidFire SDKs help you to eliminate hundreds of lines of code That’s hours of work and headaches saved through SolidFire integrations such as CloudStack. The SDKs’ easy-to-use interfaces enable you to access and automate all aspects of your SolidFire cluster quickly and efficiently, using the tools you already know.

SolidFire APIs allow complete integration. 1&1, a leading internet service provider, integrates its management and orchestration environments with the robust SolidFire API. SolidFire aligns with 1&1’s mission by simplifying the use of technology and making the cloud dependable, flexible, and accessible to small businesses, enterprises, and resellers alike. 1&1 can now offer its customers 2 million server configurations in 55 seconds (compared to 1,000 over 10 minutes prior to a SolidFire implementation). And SolidFire quality of service, enabled through the API, allows 1&1 to offer tiers of performance with no worries about the effects of noisy neighbors.

SolidFire has long been integrated with virtualization platforms and orchestration tools to enable agile solutions. Ultimate Software chose SolidFire for its ability to integrate with two

different tools: VMware and OpenStack. Integration with VMware vSphere client was a must for existing infrastructures, and OpenStack integrations were necessary for building Ultimate Software’s future roadmap. The ability to integrate with PowerShell across Ultimate Software’s ecosystem today and meet the needs of its next-generation data center make SolidFire a perfect fit.

To join NetApp’s community of developers, visit The Pub at netapp.io and follow [@NetAppPub](https://twitter.com/NetAppPub) on Twitter.

About NetApp

NetApp is the data authority for hybrid cloud. We provide a full range of hybrid cloud data services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation. Together with our partners, we empower global organizations to unleash the full potential of their data to expand customer touchpoints, foster greater innovation and optimize their operations. For more information, visit www.netapp.com. #DataDriven