

Storage Array Battery replacements and Radiance support types

This document contains information on how to determine the correct status of the battery in a a A1000, A3500, or T3 Storage Array. It will also help in determining if the Radiance support type should be set to FCO, Preventive Maintenance, or HW on-site. In reviewing cases sent onsite for Battery Replacement we have found there is generally not enough information to determine if the battery expired, as is expected at about 2 years, or if the battery actually failed. As you can see from the T3 procedures it is possible that we are replacing batteries that are not actually failed or expired.

We are asking that you use the following procedures to collect the data, insert the output into the case, and then determine the proper support type. It is important to capture the log information from the unit that validates that the battery has expired, or it has actually failed. Network Storage uses this data, along with support types, to address product quality issues.

Any time we engage the field to replace an expired or expiring battery, DO NOT use H/W on-site; use Preventative Maintenance, or FCO if it fits into the T3 FIN (see below). For all cases, please make sure that you request the log or error information that alerted the customer to the problem.

And finally, if at any time you send the field on-site for something other than a failed piece of hardware, please take a moment to determine if there is a more appropriate Support Type that could be used. Many of our engineering groups use this as a reporting feature to help determine product performance in the field.

Axx00 batteries replaced as preventive maintenance

Use the following commands to gather information about the age and status of a battery:

```
raidutil -c c#t#d# -B (to check battery age)
```

EX:

```
subdisk# raidutil -c c1t4d0 -B
```

```
LUNs found on c1t4d0.
```

```
LUN 0 RAID 0 17234 MB
```

```
LUN 1 RAID 5 12162 MB
```

```
Battery age is between 360 days and 450 days.
```

```
raidutil succeeded!
```

Anything over 730 days would be replaced as preventive maintenance.

Battery ages can be, and in the case of replacement need to be, reset. This can be achieved with the command:

```
raidutil -c c#t#d# -R
```

So there will be battery whose age is within acceptable limits but reports as failed.

T3 FCO battery replacements

For the T3 there is one FCO, FCO #: A0183-1, that we need to check for. The following serial numbers are affected by the FCO:

Suspect Power Cooling Unit serial numbers:

PART NUMBER	Power Cooling Unit Serial Numbers	Battery Pack Date Code
300-1454	001000 - 012509	before 0004
300-1454	012808 - 013279	9951-0002
300-1454	016694 - 018091	9951-0002
300-1454	013624 - 014915	0027

1) Before executing this FCO, the PCU serial number must first be identified from the "id read u#pcu#" command if it falls within the range indicated above.

a) If NO, FCO implementation is not required.

b) If YES, go to step #2 to see if the battery has already been replaced

2) To determine if a battery pack has been replaced, you will need to look at the "Battery Install Week" from the "id read u#pcu#" command. Have the field person or customer telnet or tip into the T3 unit and collect the following information:

```
hostname:/:<1>id read u1pcu1
Revision          : 0000
Manufacture Week  : 00421999
Battery Install Week : 00222001 <--- week 22 = 5/28-6/1/01
Battery Life Used  : 0 days, 0 hours
Battery Life Span  : 730 days, 12 hours
Serial Number     : 003566 <--- PCU serial #
Battery Warranty Date: 20010322172349
Battery Internal Flag: 0x00000000
Vendor ID        : TECTROL-CAN
Model ID         : 300-1454-01(50)
```

T3 Preventive Maintenance Battery replacement

This next step will help identify if the battery on a T3 has expired and needs to be replaced as Preventive Maintenance or is just a bad PCU/battery. Again, have the field person or customer tip or telnet into the T3 and check the following information:

```
stor-t300-a:/:<2>id read ulpcu1
Revision      : 0000
Manufacture Week : 00421999
Battery Install Week : 00172002
Battery Life Used  : 17 days, 0 hours
Battery Life Span  : 730 days, 12 hours
Serial Number    : 005082
Battery Warranty Date: 20020423164805
Battery Internal Flag: 0x00000000
Vendor ID       : TECTROL-CAN
Model ID       : 300-1454-01(50)
```

Battery Life Used : 17 days, 0 hours <- this field indicates how long the battery has been in use. You will see battery faults when the age is over 730 days, 2 years.

Here is an example of a PCU/battery that should be replaced as Preventive Maintenance but hasn't reached its expiration date.

First the fru stat command indicates that the battery in ulpcu1 is faulted:

```
stor-t300-a:/:<1>fru s
CTLR STATUS STATE  ROLE  PARTNER TEMP
-----
ulctr ready enabled master - 29.5
u2ctr ready disabled - - -
```

...

```
u1l2 ready enabled slave - installed 29.5
```

```
POWER STATUS STATE  SOURCE OUTPUT BATTERY TEMP FAN1 FAN2
-----
u1pcu1 ready enabled line normal fault normal normal normal
u1pcu2 ready enabled line normal normal normal normal normal
u2pcu1 ready enabled line normal normal normal normal normal
u2pcu2 ready enabled line normal normal normal normal normal
stor-t300-a:/:<2>
```

We now need to check if a battery refresh is in progress with the 'refresh -s' command:

```
stor-t300-a:/:<3>refresh -s
No battery refreshing Task is currently running.
```

	PCU1	PCU2
U1	BAT Low	Normal
U2	Normal	Normal

Current Time Tue May 28 03:01:28 2002
Next Refresh Sun Jun 02 00:30:00 2002
stor-t300-a:/:<4>

Since there isn't a battery refresh happening, we should check the battery serial number and age to verify that it isn't related to the FCO.

```
EX:
stor-t300-a:/:<5>id read u1pcu1
Revision      : 0000
Manufacture Week : 00411999
Battery Install Week : 00411999
Battery Life Used  : 5 days, 7 hours
Battery Life Span  : 730 days, 12 hours
Serial Number    : 004709
Battery Warranty Date: 20020522183743
Battery Internal Flag: 0x00000000
Vendor ID       : TECTROL-CAN
Model ID        : 300-1454-01(50)
stor-t300-a:/:<6>
```

This battery is just bad and needs to be replaced and the support type need to be Preventive Maintenance.

T3 batteries that don't need to be replaced

Just because fru stat reports a battery as failed doesn't mean that it should be replaced.

EX:

stor-t300-b/:<9>!!

fru s

CTLR	STATUS	STATE	ROLE	PARTNER	TEMP
------	--------	-------	------	---------	------

u1ctr	ready	enabled	master	u2ctr	31.5
u2ctr	ready	enabled	alt master	u1ctr	31.5

.....

POWER	STATUS	STATE	SOURCE	OUTPUT	BATTERY	TEMP	FAN1	FAN2
u1pcu1	ready	substituted	battery	normal	fault	normal	normal	normal
u1pcu2	ready	enabled	line	normal	normal	normal	normal	normal
u2pcu1	ready	substituted	battery	normal	fault	normal	normal	normal
u2pcu2	ready	enabled	line	normal	normal	normal	normal	normal

Fru stat reports two batteries as faulted but when we check the for battery refreshes we see that the batteries are being discharged. This process can take up to 24 hours and the PCU/battery shouldn't be replaced.

stor-t300-b/:<10>refresh -s

	PCU1	PCU2
U1	Discharging	Pending
U2	Discharging	Pending

Current Time Tue May 28 14:12:42 2002
Start Time Tue May 28 14:04:47 2002
Total time elapsed : 0 hours, 7 minutes, 55 seconds.
stor-t300-b/:<11>

Written by:
Jose E. Sousa