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Reducing Network Spares: A Low-Cost, High-Impact Approach

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Realizing all potential plug-in returns from the field can greatly reduce overall plug-in purchases. Potential returns can be identified and prioritized by utilizing readily available data from Provisioning and Warehouse management systems.

This paper describes a novel approach for ensuring that field forces return plug-ins that have become idle as a result of disconnect activity.

Background

In any successful large telecom, the Operations organization is focused on customer service. Delivery dates are met. Period. Although this philosophy results in high customer satisfaction, it can have a subtle, yet costly impact on the bottom line.

"This philosophy can have a subtle, yet costly impact to the bottom line."

If your performance is measured on meeting customer due dates, and those dates are dependent upon utilizing plug-ins shipped from the warehouse, you will hold onto as many plug-ins as possible. This minimizes the risk of obtaining plug-ins needed to provide service, thus maximizing your ability to meet the customer due date.

As an Operations technician, you are *not* focused on returning plug-ins to the warehouse after disconnect because: 1) There is no additional work involved in holding onto the plug-in versus spending time to box, label, and ship it; and 2) You may need that same plug-in to meet a future service demand.

Plug-in recovery efforts throughout the industry have proven there are large numbers of plug-ins available for re-use. However, to the management systems, these plug-ins appear as "working" in central offices, not spare. Historically this is why plug-in recovery efforts have been primarily a manual process or limited to small groups of smart technology.

Periodic recovery efforts are one way to treat the "symptoms" of the disconnect situation. However, the opportunity exists to correct the situation without additional burden on technicians or separate recovery forces.

Supply Chain is also focused on customer service. They must ensure that any plug-ins needed are available within the company and these plug-ins are received by the field prior to their associated due dates.

Having a large idle supply helps Supply Chain achieve these goals, but also creates a large non-revenue-producing expense. This expense will produce revenue sometime in the future when the equipment is deployed into service, but as more and more time passes before deployment, total cost of ownership greatly increases.

Current Process

Today, the largest trigger for plug-in demand is associated with the Provisioning System, TIRKS. In a typical LEC there can be over 2,000 plug-ins required to meet a single day's circuit order demand.

A simplified look at the process is:
• A customer initiates a circuit order, which is then designed within TIRKS and passed to PICS/DCPR.
• The PICS system notifies the warehouse management system to ship the required plug-ins.
• Warehouse personnel typically pack and ship the plug-ins back to the central office.
• The warehouse management system confirms the shipment in PICS/DCPR and PICS transfers the plug-ins to the field location, updating the status to *Working*.

When the time comes to connect the circuit, the field technician retrieves the plug-ins from the pending jobs cabinet and uses them to connect the circuit.

When the customer no longer needs the circuit, a disconnect notice is generated in TIRKS and passed to the workforce administration system. After the circuit disconnect is completed, a notice is sent to PICS/DCPR that tells PICS to move the plug-in(s) from *Working* to *Spare* status.

The actual "Completion" of the disconnect may be accomplished by:
• Leaving the plug-in at "half-mast" in the frame,
• Moving the plug-in to the spare cabinet or other "local storage," or
• Returning the plug-in to the warehouse for reuse.

The Supply Chain Organization is never notified that plug-ins have been made spare in the field. The only way to determine that spares exist is to review the records in PICS/DCPR. However, over the years, a large number of Asset Verification Reviews have shown that the spare numbers indicated in PICS/DCPR are inaccurate.

"Only returning the plug-ins to the warehouse… makes them available for re-use."

The lack of notification and reliable data on these spares means that completion methods of "half-mast" and "local storage" result in these spare plug-ins being stranded in the field. Only returning the plug-ins to the warehouse, where they are captured back into the warehouse management system, makes them available for reuse.

Supply Chain also sets the Target Spare Levels in the warehouse and the Central Office locations. These Stock Levels are set with the intention of covering forecasted short interval demand. Historically, the target levels – and ultimately the purchase quantities – are based on the usage demand *and do not incorporate the volume of disconnects.*

Problems with the Current Process

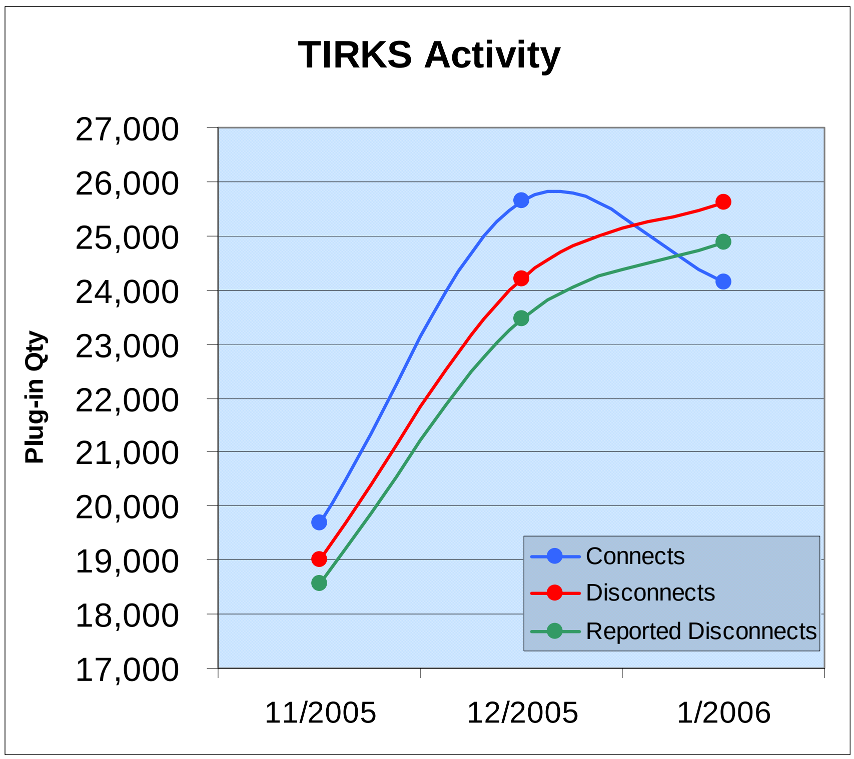
• Completing a disconnect work order does not guarantee plug-ins are returned to the warehouse for re-use.

• The spare counts in the existing asset systems are inaccurate and thus cannot be used to identify poorly compliant offices.

• Target Stock Level and Purchase calculations do not take into account disconnect activity as a potential source of available spare plug-ins.

Activity Volume

Now the process of how spare plug-ins become stranded in the field has been described, so the next logical question is *how many are there?* The following graph shows the volume of related activity over a three-month period of transactions in a typical LEC.



Examining the data, the following observations can be made:

• There are roughly as many connect requests as disconnect requests on a total plug-in quantity basis.

• A large number (approx. 500 plug-ins per month) of disconnects are never reported through the workforce administration system.

These observations lead to the conclusion there are a large number of plug-in disconnects in the field that could potentially be redeployed.

"Disconnects amount to over $82M per year in unmanaged transactions"

The current process does not manage the disposition of the disconnected plug-ins. It is left to the field forces to return them when it is convenient. To put the magnitude of this situation into perspective — there are an average of 22,933 disconnects per month, which at an average cost of $300 per plug-in amounts to over $82M per year in "unmanaged" transactions.

Over the three-month period, 68,798 plug-ins were disconnected. Out of this total, 20,521 were of the same types (HECIs) that were purchased during the same three-month period. This immediate re-stock of 29.8% of the disconnects represents an annualized purchase deferral of $24M. We anticipate reporting even greater savings with a larger dataset (an entire year) that would capture any seasonal effects.

For example, in 2004, one large LEC reported saving $40M in new purchases as a result of recovery efforts. In 2002, another LEC realized a savings of $30M in re-used plug-ins over a single year program.

Adding Agility to the Supply Chain

"Locations can be ranked by their potential savings."

The provisioning data (from TIRKS) provides information on the disconnects or *Expected Returns.* The warehouse management system provides data on the plug-ins received from the field or *Actual Returns*. By comparing the Expected Returns to the Actual Returns, we can see the disconnected plug-ins that were not returned (regardless of whether the disconnect order has been reported as worked or not). This "Unreturned Report" provides the basis for managing the disconnects.

Utilizing a plug-in purchase price history (by HECI) a dollar value can be assigned to each unreturned plug-in. By grouping this data by CLLI, each location's potential savings can be calculated. The locations can then be ranked from greatest to least potential savings.

Specifically, the ranking for a location would be calculated as follows:

$$\text{Rank} = \sum_{\text{DISCONNECT}} \sum_{\text{HECI}} \text{Quantity} * \text{Unit Price} * (\text{Current Date} - \text{Due Date} - \text{Quiet Period})$$

Where:

Quantity is the number of plug-ins for the given HECI on the disconnect request.

Unit Price is the current purchase unit price of the given HECI.

Current Date is the date of the analysis.

Due Date is the date the disconnect work order is to be completed by.

Quiet Period is the amount of time in days allowed for the disconnected plug-ins to arrive at the warehouse.

Values where the age of the disconnect, i.e., Current Date – Due Date – Quiet Period, is less than zero will be ignored. These values mean the disconnect is not due yet or is still within the time frame allowed for transit of the plug-ins to the warehouse.

"The data can be summarized at various levels so that accountability can run the entire management chain."

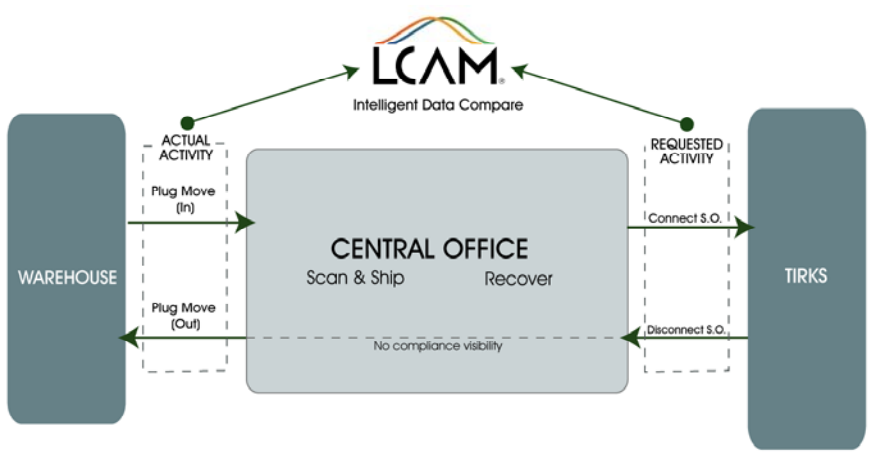
Aside from showing the details of the specific plug-ins that should be returned, the "Unreturned Report" could be summarized by state, district and central office, so that accountability for disconnect re-use can run the entire management chain.

LCAM Implementation

Alden's Life Cycle Asset Manager (LCAM) successfully implements this strategy for reducing spare plug-in purchases.

LCAM's TIRKS interface captures provisioning data including disconnect requests while the warehouse system interface captures return plug-in shipments from the field. Additionally with its invoice authorization and payment module, LCAM generates an internal price table of plug-in purchase prices.

These three components combined with LCAM's rich 100% web-based user interface allows for successful management of the disconnects which produces *a tangible bottom line savings in plug-in purchases.*



Conclusion

Data from the Provisioning System (TIRKS) and the warehouse management system can be used to implement a "hands-off" approach to monitoring disconnect activity and ensuring spare plug-ins are returned to the warehouse for re-use. Maximum re-deployment of disconnected plug-ins in a large LEC can amount to as much as $82M annually in potential deferred purchase savings.

Next Steps

Reducing spare plug-in purchases by maximizing utilization of disconnected plug-ins through their return to the warehouse is just one of the first steps in adding agility to the supply chain.

Expanding upon this concept, the next steps in our strategy are:

• Filter the ranking calculation to include only plug-in types (HECIs) designated as reusable by the supply chain organization.

• Source new connect requests locally from disconnected plug-ins by holding the disconnects in the central office for some period of time before returning to the warehouse.

• Examine the connect shipments to determine if excess or duplicate shipping is occurring.

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