

# **Pod Assignment Guide**

Document Version: 2011-08-02

This guide covers features available in NETLAB+ version **2010.R5** and later.

Copyright © 2010, Network Development Group, Incorporated. www.netdevgroup.com

NETLAB Academy Edition and NETLAB+ are registered trademarks of Network Development Group, Inc.

VMware is a registered trademark of VMware, Inc. Cisco, IOS, Cisco IOS, Networking Academy, CCNA, CCNP, and PIX are registered trademarks of Cisco Systems, Inc.



1	Inti	roduction	3
2		derstanding Pod Resource Management Features	
	2.1	Considering Your Pod Resource Costs	
	2.2	Choosing a Pod Resource Management Strategy	6
	2.3	Combining Pod Resource Management Features	7
3	lm	olementing Pod Assignment	8
	3.1	Pod Assignment Roles	8
	3.2	Creating Pod Assignments	9
	3.3	Example 1 – Pod Assignment for Pod 1	
	3.3	.1 Step 1 - System Level Assignment for Pod 1	. 11
	3.3	.2 Step 2 - Community Level Assignment for Pod 1	. 13
	3.4	Example 2 – Pod Assignment for Pod 2	. 16
	3.4	.1 Step 1 - System Level Assignment for Pod 2	. 16
	3.4	.2 Step 2 - Community Level Assignment for Pod 2	. 18
	3.4	.3 Step 3 - Class Level Assignments for Pod 2	. 20
	3.5	Example 3 – Pod Assignment for Pod 10	. <b>2</b> 3
	3.6	Example 4 – Pod Assignment for Pod 5	
	3.7	Removing Pod Assignments	. 25



#### 1 Introduction

In this guide, we provide an overview of pod resource management features along with a detailed discussion of the use of the Pod Assignment feature. NETLAB+ provides a variety of tools, which allow administrators and instructors a flexible means of allocating lab resources. As technology evolves, so have the types of training and lab devices that organizations rely upon their NETLAB+ system to provide scheduled, shared access. The pod assignment feature was added to NETLAB+ as a means to manage access to low cost, pure virtual machines.

Pod Assignment is a pod resource management feature, which allows pods to be assigned and visible only to those who have been granted access. The flexibility of pod assignment allows pods to be assigned at the community, class, instructor, student and student team level. Pod assignment is initiated at the system level by the Administrator. Community and class level assignments may be delegated to instructors.

An important benefit that the use of pod assignment provides is the ability to save the pods in a progressive linear state. This allows the user(s) who has been assigned exclusive use of the pod to continue using the pod in the state it was left at the end of the previous lab reservation. This feature is a necessity when the lab exercises of an instructional curriculum build on from one lab exercise to the next (such as a scenario where the results of performing "Lab 1" is the starting point for "Lab 2", the results of "Lab 2" is the starting point for "Lab 3", etc.).

The concepts of Communities and Pod Rules are explained in the <u>NETLAB+</u> <u>Administrator Guide</u>. A thorough understanding of these concepts is necessary in order to effectively use the Pod Assignment feature as described in this guide.

8/2/2011 Page 3 of 25



# 2 Understanding Pod Resource Management Features

NETLAB+ provides several features that may be used for pod resource management. Selecting the appropriate features to use on your system will depend upon a number of factors, including the type of pods on your system and the number of users and communities being served by your system. Pod resource management features may be combined to allow you to customize your resource management strategy. The purpose of each pod resource management feature and effect on the scheduler is defined in the table below.

# **Pod Resource Management Features**

Pod Feature	Intended Purpose	Effect on Scheduler	
Pod Assignment	Exclusive Access	Pod is visible only to assignees.	
Time Based Pod Rules	Guaranteed Availability	Specified time slots are available for users who match the rule. Specified time slots are marked unavailable for users who do not match the rule.	
Proactive Resource Awareness	Prevent Oversubscription	Time slots that would oversubscribe VM server CPU or memory resources are marked unavailable and shown in red.	
Minimum Time Between Reservations	Equitable Access	Impose a waiting period between successive reservations made by same student or team.	
Maximum Length of Reservation	Equitable Access	Limit the length of a pod reservation made by student or team.	

8/2/2011 Page 4 of 25



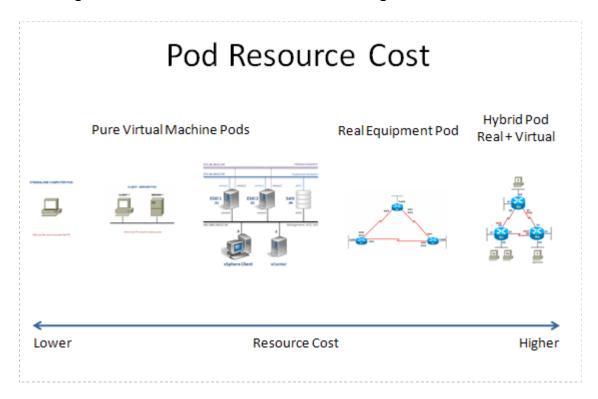
#### 2.1 Considering Your Pod Resource Costs

The type and quantity of lab devices on your NETLAB+ system provides a good indicator of the pod resource management strategies that would best suit your needs.

As technology evolves, so have the types of training and lab devices that organizations rely upon their NETLAB+ to provide scheduled, shared access. Traditionally, NETLAB+ has been used to provide access to equipment pods containing actual (vs. virtual) equipment or a hybrid pod of real and virtual equipment. This use of NETLAB+ allows many users to have access to costly equipment, thus allowing organizations to maximize their return on their investment in lab equipment. For systems simply comprised of one or more real equipment pods, using pod rules may be adequate to manage your resources, if allocating your lab resources at the community level delivers the amount of control desired.

It is exciting to see that NETLAB+ has evolved into an invaluable tool to facilitate access to low cost, pure virtual machine pods. In this case, the resource management strategy focuses on assigning pods for the exclusive use of a group of individuals (community, class or team) or a certain individual (instructor or student), often for an entire semester. If your system consists of numerous lower cost pods, such as the Pure Virtual Machine Pods shown in the picture below, pod assignment will be a key part of your pod resource management strategy.

#### Pod Assignment Is the Ideal Choice for Resource Management of Lower Cost Pods



8/2/2011 Page 5 of 25



### 2.2 Choosing a Pod Resource Management Strategy

Using the Pod Assignment feature should be considered if **any** of the following are true:

- You have numerous low cost pods on your system (see section 2.1).
- You require the flexibility to allocate exclusive access to pods at the community, class, instructor, student team and individual student levels.
- You require the ability to save the pods in a progressive linear state. This allows the user(s) who has been assigned exclusive use of the pod to continue using the pod in the state it was left at the end of the previous lab reservation.
- Prior to the availability of the pod assignment feature, the limitations of pod rules have led you to define individuals or individual classes as communities, in order to use pod rules to manage your system's lab resources.

When planning your resource management strategy for virtualized pods, you should also consider the use of *Proactive Resource Awareness*. Proactive Resource Awareness is a scheduling feature unique to NETLAB+, which allows you to time-share virtualization servers using the NETLAB+ scheduler. NETLAB+ proactively manages the availability of pods, so that virtual machines are not oversubscribed, ensuring a quality lab experience for all users. For more information, see the *Proactive Resource Awareness* section of the *Remote PC Guide for VMware Implementation Using ESXi versions 4.01 and 4.1 with vCenter*.

8/2/2011 Page 6 of 25



# 2.3 Combining Pod Resource Management Features

Pod resource management features may be combined. The order in which the NETLAB+ system evaluates the feature settings is shown in the table below.

# **System Evaluation Order of Pod Resource Management Features**

Pod Resource Management Feature	Primary Purpose	Level	System Evaluation Order
		System	1st
Pod Assignment	Exclusive Access	Community	2 <sup>nd</sup>
		Class	3 <sup>rd</sup>
Pod Rules	Guaranteed Availability	System	4 <sup>th</sup>
Proactive Resource Awareness	Prevent Oversubscription	System	th 5
Minimum Time Between Reservations	Equitable Access	Class	6 <sup>th</sup>
Maximum Length of Reservation	Equitable Access	Class	7 <sup>th</sup>

8/2/2011 Page 7 of 25



#### 3 Implementing Pod Assignment

Pod assignment is a resource management feature that grants exclusive access to a pod. In the sections below, we will discuss the process of setting up pod assignments using examples that illustrate how pod assignment is an effective strategy of allocating pod resources.

#### 3.1 Pod Assignment Roles

At the System Administrator level, you can assign pods to a community, class, user or team. Although class, user and team assignments can be made at this level, it is a good practice to make system level assignments to communities only, and allow community administrators and instructors to manage pod assignments at the individual community and class levels.

A community administrator may make pod assignments for pods that have been assigned to their community at the class, user, and team level. As the system administrator, you may appoint an instructor to act as a community administrator by assigning the instructor community management privileges (see the Edit Accounts section of the NETLAB+ Administrator Guide).

A class instructor has the authority to make pod assignments for pods that have been assigned to the instructor's class, at the user and team level.

Assign Pod To	System Administrator	Community Administrator	Class Instructor
Community	<b>√</b>		
Class	<b>4</b>	<b>1</b>	
User	<b>*</b>	<b>*</b>	<b>1</b>
Team	<b>√</b>	<b>√</b>	

8/2/2011 Page 8 of 25



# 3.2 Creating Pod Assignments



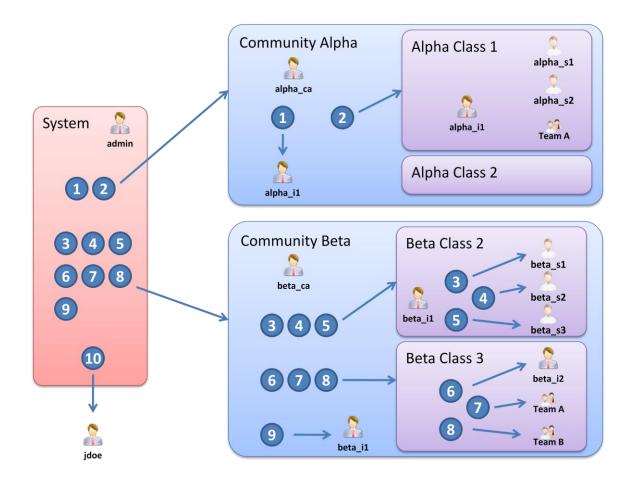
Using the Administrator account, select the option for system level pod assignment. A list of pods installed on your NETLAB+ system will be displayed, along with the total number of pod assignments for each pod.

Selec	t Pod		
Pod ID	Туре	Name	Total Pod Assignments
01	AE Basic Router Pod V2	POD 1	2
2	DEV Wireless Controllers	Wireless Testing	0
3	ASA Testing	POD 3	5
4	AE Basic Router Pod V1	POD 4	0
O 5	AE Multi-purpose Academy Pod	Galactica	0
O 6	J4300 Dev	J4300 Dev	1
O 7	Juniper Switching Pod (JSP)	EX3200 Dev	0
O 8	Basic VMware Academy Pod	ICM Pod Rich	0
O 9	Basic VMware Academy Pod	ICM Pod Kaan	0
101	Standalone Computer Pod	ICM 1	2
102	Standalone Computer Pod	ICM 2	2
103	Standalone Computer Pod	ICM 3	3
104	Standalone Computer Pod	ICM 4	3
105	Standalone Computer Pod	ICM 5	3
106	Standalone Computer Pod	ICM 6	3
107	Standalone Computer Pod	ICM 7	3
108	Standalone Computer Pod	ICM 8	3
109	Standalone Computer Pod	ICM 9	2
110	Standalone Computer Pod	ICM 10	1

8/2/2011 Page 9 of 25



For the purpose of this discussion, we will examine how pod rules can be used to allocate the resources of several Pure Virtual Machine Pods. These pods are represented on the pod list of our example system above as Pods 101-110, which correspond to Pods 1-10 on the diagram below.



8/2/2011 Page 10 of 25



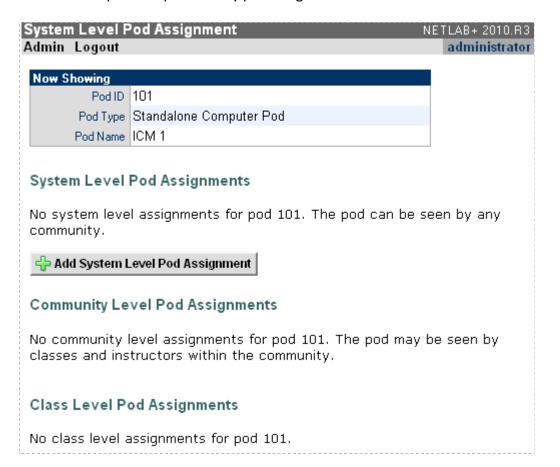
#### 3.3 Example 1 – Pod Assignment for Pod 1

In this example, we will complete the pod assignment steps necessary to assign Pod 1. This will require us to first assign Pod 1 to Community Alpha, and then assign Pod 1 to an instructor in Community Alpha, alpha\_i1. The portion of the diagram from section 3.2 relevant to this example is shown below.



### 3.3.1 Step 1 - System Level Assignment for Pod 1

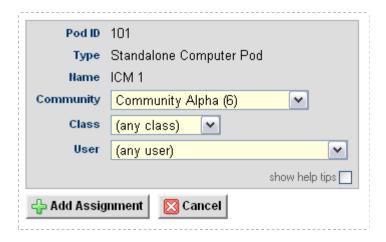
Select Pod 101 from the pod list displayed for system level pod assignment (see 3.2). The status of pod 101 prior to any pod assignments is shown below.



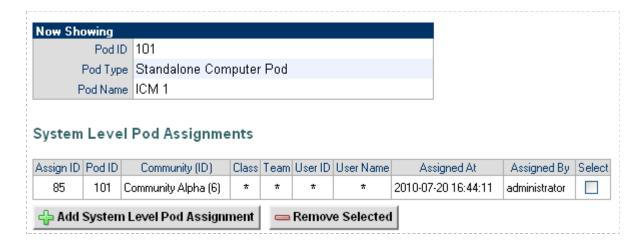
8/2/2011 Page 11 of 25



To add a pod assignment, click **Add System Level Pod Assignment** and select Community Alpha as the community.



Select **Add Assignment**. The system level assignment to the community is now displayed for Pod 101.



8/2/2011 Page 12 of 25



# 3.3.2 Step 2 - Community Level Assignment for Pod 1

As we continue the pod assignment process for pod 101, we assume that administrative responsibility for Community Alpha has been delegated to instructor alpha\_ca. Instructor alpha\_ca is an instructor with *community management privileges* (see the edit accounts section of the NETLAB+ Administrator Guide).

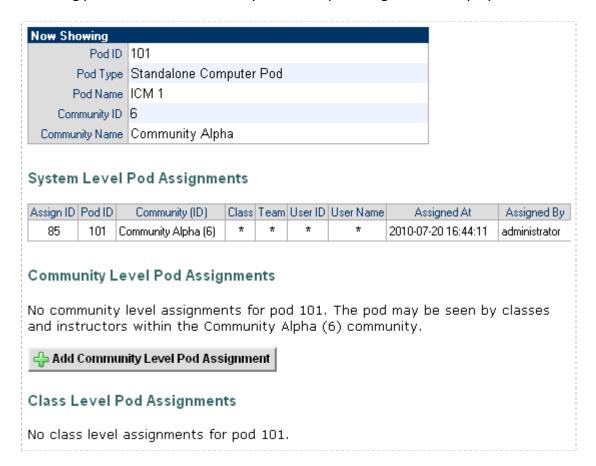
Instructors with community management privileges can access the pod assignment feature by selecting the icon on their MyNetlab page. The pods available for assignment within the instructor's community are displayed. Pods that are on the NETLAB+ system but not displayed on the list have been assigned to someone else by the system administrator. Here, we see that several pods, including Pod 101 are available for assignment within Community Alpha.

Pod ID	Туре	Name	Community/Class Pod Assignments
2	DEV Wireless Controllers	Wireless Testing	0
4	AE Basic Router Pod V1	POD 4	0
O 5	AE Multi-purpose Academy Pod	Galactica	0
7	Juniper Switching Pod (JSP)	EX3200 Dev	0
© 8	Basic VMware Academy Pod	ICM Pod R	0
9	Basic VMware Academy Pod	ICM Pod K	0
101	Standalone Computer Pod	ICM 1	1
102	Standalone Computer Pod	ICM 2	2
<b>⊠</b> Ex	it		

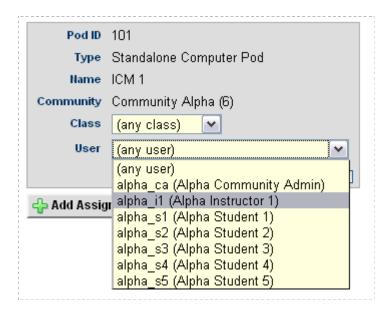
8/2/2011 Page 13 of 25



Selecting pod 101 we see that the system level pod assignment is displayed.



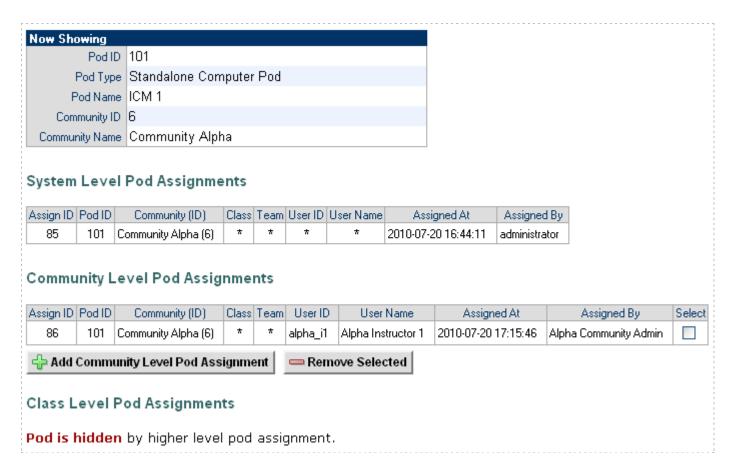
Select **Add Community Level Pod Assignment**. As shown below, there are options to select a pod assignment to any class or any individual user within the community. We will assign Pod 101 to instructor alpha\_i1.



8/2/2011 Page 14 of 25



After selecting **Add Assignment**, the pod assignment to instructor alpha\_i1 is displayed. Notice also that the pod is indicated to be hidden from class level pod assignments by a higher level pod assignment. This is due to the pod being assigned at the community level to an instructor for the instructor's own use.

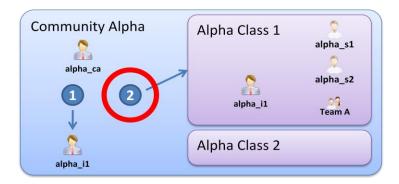


8/2/2011 Page 15 of 25



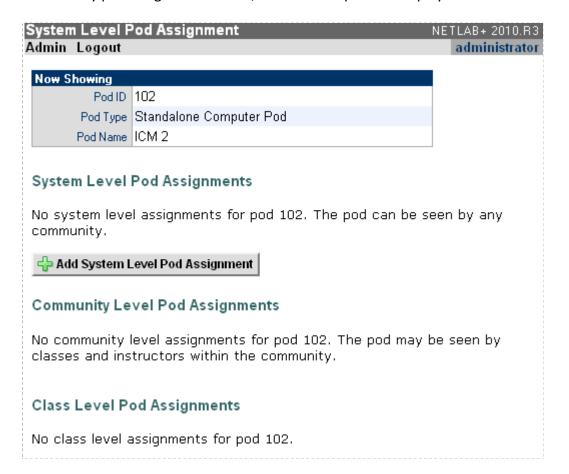
#### 3.4 Example 2 – Pod Assignment for Pod 2

As shown on the diagram (see 3.2), Pod 2 will also be assigned to Community Alpha. In this example, we will complete the pod assignment steps necessary to assign Pod 2 to Community Alpha, and then assign it to Alpha Class 1. We will then make pod assignments for individual and team members of Alpha Class 1.



#### 3.4.1 Step 1 - System Level Assignment for Pod 2

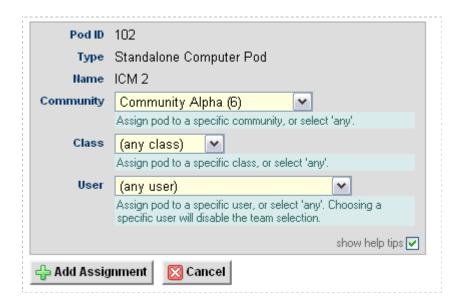
Select Pod 102 from the pod list displayed for system level pod assignment (see 3.2). Prior to any pod assignments made, the status of pod 2 is displayed as shown below.



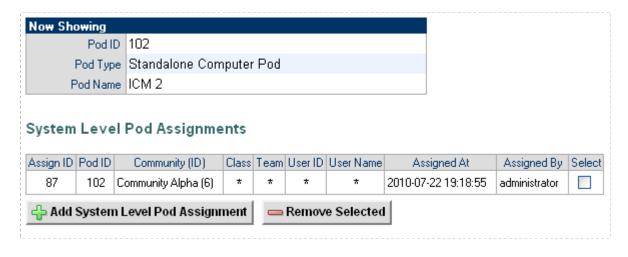
8/2/2011 Page 16 of 25



Select **Add System Level Pod Assignment** and select Community Alpha as the community. Notice also that the option to show help tips provides additional guidance on the options available through the pod assignment feature.



Select Add Assignment. The system-level assignment is now displayed for Pod 102.



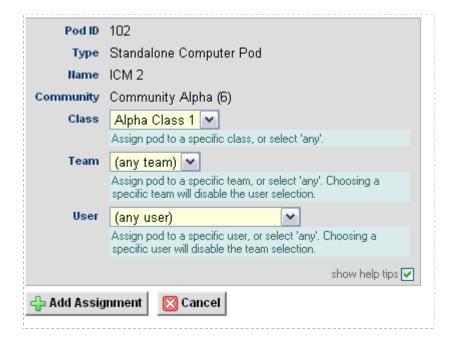
8/2/2011 Page 17 of 25



# 3.4.2 Step 2 - Community Level Assignment for Pod 2

As in example 1, we assume that administrative responsibility for Community Alpha has been delegated to instructor alpha\_ca. Instructor alpha\_ca will make an assignment to Alpha Class 1, as shown below. Team and user assignments will be completed in the next step, by the class instructor.

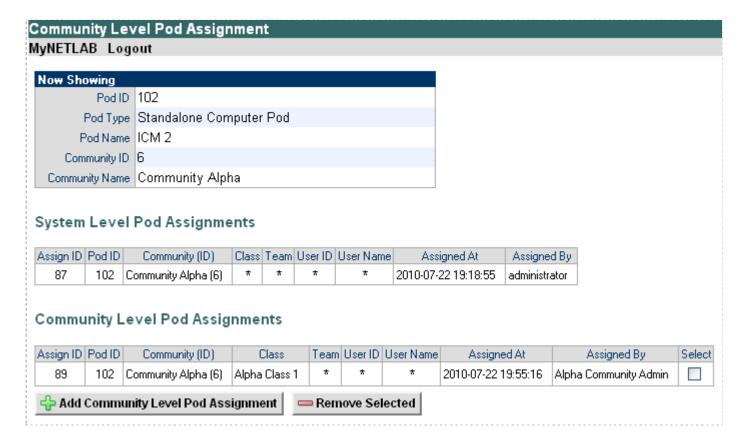
Although it is possible to make team and user assignments at the community level, the best practice is for this step to be completed by the class instructor (section 3.1).



8/2/2011 Page 18 of 25



The community level assignment is now displayed on the assignment page.



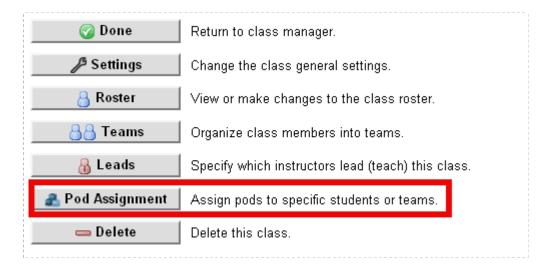
8/2/2011 Page 19 of 25



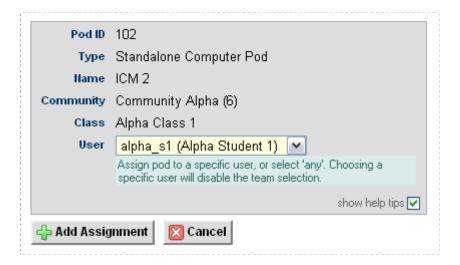
### 3.4.3 Step 3 - Class Level Assignments for Pod 2

As discussed in the previous section, a pod assignment was made for pod 102 to Alpha Class 1 by the community administrator. Pod assignments to specific members of Alpha Class 1 may be made by the lead instructor of the class, alpha i1.

Pod assignments made by the lead instructor(s) at the class level are done through the class manager. When instructor alpha\_i1 selects Alpha Class 1 in the class manager, pod assignment is included in the list of options at the bottom of the page.



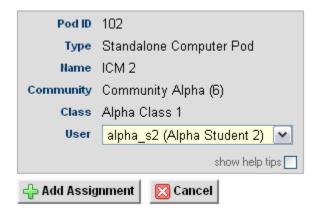
An assignment is made to a student in Alpha Class 1, alpha s1.



8/2/2011 Page 20 of 25



Next, an assignment is made to student alpha\_s2.



A pod assignment is also made to a team, Team A.



8/2/2011 Page 21 of 25



Pod assignments have been completed for pod 102.

Now Showing	
Pod ID	102
Pod Type	Standalone Computer Pod
Pod Name	ICM 2
Community ID	6
Community Name	Community Alpha
Class	Alpha Class 1

# System Level Pod Assignments

Assign ID	Pod ID	Community (ID)	Class	Team	User ID	User Name	Assigned At	Assigned By
87	102	Community Alpha (6)	*	*	*	*	2010-07-22 19:18:55	administrator

# **Community Level Pod Assignments**

Assign ID	Pod ID	Community (ID)	Class	Team	User ID	User Name	Assigned At	Assigned By
89	102	Community Alpha (6)	Alpha Class 1	*	*	*	2010-07-22 19:55:16	Alpha Community Admin

# Class Level Pod Assignments

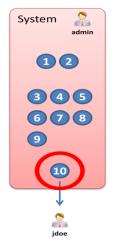
	Assign ID	Pod ID	Community (ID)	Class	Team	User ID	User Name	Assigned At	Assigned By	Select
	91	102	Community Alpha (6)	Alpha Class 1	*	alpha_s1	Alpha Student 1	2010-07-22 20:43:31	Alpha Instructor 1	
	92	102	Community Alpha (6)	Alpha Class 1	*	alpha_s2	Alpha Student 2	2010-07-22 20:48:54	Alpha Instructor 1	
	93	102	Community Alpha (6)	Alpha Class 1	Α	*	*	2010-07-22 20:51:24	Alpha Instructor 1	
l		Class I	and Dad Assignmen	mal Dan		alaatad		,	,	



8/2/2011 Page 22 of 25

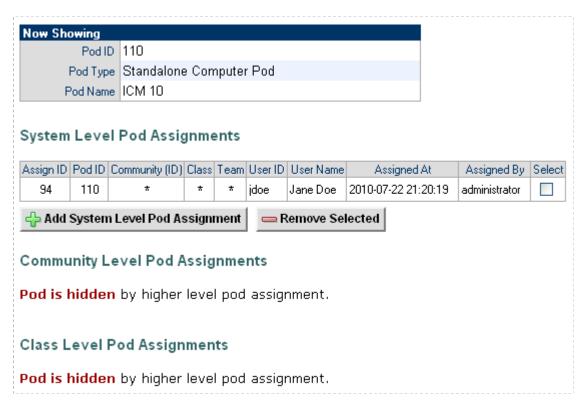


#### 3.5 Example 3 – Pod Assignment for Pod 10



In this example, a pod assignment for Pod 10 is made at the system level directly to an instructor, jdoe.

The pod assignment was completed as a single step at the system level. For this and the next example, we simply show the pod assignments made, rather than detailing each step required to add the assignments.

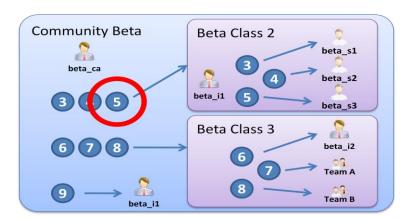


8/2/2011 Page 23 of 25

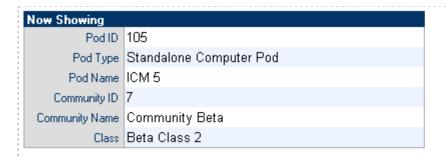


# 3.6 Example 4 – Pod Assignment for Pod 5

In this example, a pod assignment for Pod 5 is made to Community Beta, Beta Class 2, student, beta\_s3.



Here are the pod assignments made to Pod 105.



# System Level Pod Assignments

Assign ID	Pod ID	Community (ID)	Class	Team	User ID	User Name	Assigned At	Assigned By
67	105	Community Beta (7)	*	*	*	*	2010-05-28 18:35:58	administrator

# Community Level Pod Assignments

Assign ID	Pod ID	Community (ID)	Class	Team	User ID	User Name	Assigned At	Assigned By
74	105	Community Beta (7)	Beta Class 2	*	*	*	2010-05-28 18:50:36	Beta Community Admin

#### Class Level Pod Assignments

Assign ID	Pod ID	Community (ID)	Class	Team	User ID	User Name	Assigned At	Assigned By	Select
79	105	Community Beta (7)	Beta Class 2	*	beta_s3	Beta Student 3	2010-05-28 18:54:11	Beta Instructor 1	
Add Class Level Pod Assignment Remove Selected									

8/2/2011 Page 24 of 25

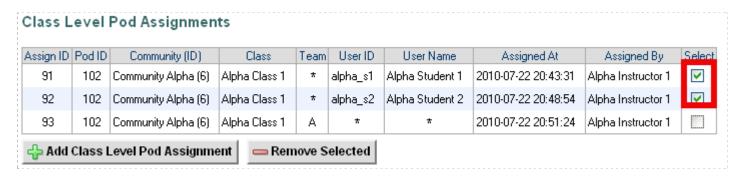


### 3.7 Removing Pod Assignments

Pod assignments may be easily removed as needed. The option to remove a pod assignment is available to those who have the authority to remove it.

- System level pod assignments may only be removed by the administrator.
- Community level pod assignments may be removed by any instructor in the community with community-level privileges.
- Any lead instructor for a class may remove pod assignments made at the class level for individual students or teams.

Recall example 2, step 3 (section 3.4.3) where several class-level pod assignments were made. As lead instructor, instructor alpha\_i1 manages class level pod assignments through the class manager. To remove the pod assignments for students alpha\_s1 and alpha\_s2, check the selection box to the right of each assignment.



#### Select Remove Selected.



Click OK to confirm the removal of the pod assignments. The 2 selected pod assignments have been removed from the class level pod assignments.



8/2/2011 Page 25 of 25